

State Job Awards to Continue
At Brisk Level page 64

January, 1961

ROADS^{AND} STREETS

A GILLETTE PUBLICATION



UNIVERSITY MICROFILMS
EUGENE B. POWER
313 N. 1ST ST.
ANN ARBOR, MICH.
COMP-LTRV-11-50

RENT A JACKSON

IT'S A SOUND, NO-RISK WAY OF DISCOVERING THE FASTEST, MOST EFFECTIVE AND BY FAR THE MOST INEXPENSIVE METHOD OF COMPACTING GRANULAR SOILS; BASE COURSES, FILLS AND SOIL-CEMENT MIXES.



Changing from the 13 ft., 3 inch working width to 88 inches overall for road travel or maneuverability on the job is accomplished hydraulically in just 30 SECONDS.



The new widening attachment (optional at added cost) is raised or lowered instantly. Makes the JACKSON by far the most efficient compactor for widening projects.

As one contractor on a federal highway project put it: "We rented this vibratory compactor from our dealer just for this job, but we're so pleased with its performance that we'll probably buy it. It has the versatility and punch to handle all our compacting, both big and small jobs, on slopes and level ground — QUICKLY."

VERSATILITY? Look at the illustrations. Then consider, too, that the individual compactor units may be fitted with operating handles and used as self-propelling units to compact the tight places other equipment can't touch. Also that the JACKSON operates in either direction, no deadheading or turning around is required.

PUNCH? 4200 3-TON BLOWS PER MINUTE from each of the compactor units provide extremely high productivity. 100% of specified density is frequently attained in a single pass. And the JACKSON does not leave the top 1-inch of the lift in a loose condition . . . a very important consideration. Maintenance and operational costs are extremely low.

Discover the outstanding time-and-money-saving opportunities afforded by the JACKSON MULTIPLE COMPACTOR by renting one from your Jackson Distributor. Name and further details on request.

. . . for more details circle 305 on enclosed return postal card

JACKSON VIBRATORS, INC.

LUDINGTON, MICHIGAN

Look for the strength ... branded on the bar

*For quick, positive identification of
Bethlehem high-strength reinforcing bars*



"B" for Bethlehem.

Bar size number (always between "B" and "-N-").

"-N-" for new billet steel.

High-strength bars have a "6" for the
60,000 psi min. yield (A-432) bars, and a "7"
for the 75,000 psi min. yield (A-431) bars.

All Bethlehem bars have a pedigree

Certified mill test reports, furnished by Bethlehem, are matched with heat numbers by which the bundles of bars are identified. When you buy Bethlehem bars you are assured of composition, mechanical, and physical properties fully meeting all requirements of ASTM Billet-Steel Bar Specifications—a certified pedigree.

New booklet has helpful data on high-strength bars

A new booklet contains practical information about Bethlehem high-strength bars, some aspects of new design theories (with consequent savings in money and materials), proper welding techniques, and details on the king-sized bars, 14S and 18S. A copy is yours by writing any Bethlehem sales office, or directly to us at Bethlehem, Pa.



For strength
... economy
... versatility

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Sales: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



HIGHWAYS • BRIDGES • AIR FIELDS • HEAVY CONSTRUCTION

- Industry Affairs**
- 19 Washington Newsletter
 - 59 Tallamy to AASHO: Big Road Need Ahead
 - 64 Road Awards to Continue at High Level
 - 86 AED Convention to Map Industry Course
 - 91 Quality Problem Reviewed at AASHO Meeting

- Contractor Management,
Equipment Utilization,
Job Methods**
- 34 Airfield Paving Train Moved Back Nightly
 - 37 Shoe-String Equipment Financing Hurts Everybody
 - 38 Air-on-the-Run, Test Rolling, New on This Grading Job
 - 50 Army Turning Out Trained Operators
 - 70 "Our Safety Program Helped Profits, Too"
 - 94 Rate Contractors on Job Performance
 - 102 380,000 Ton Asphalt Job for Desert Freeway

- Engineering, Technical,
Maintenance**
- 45 Urban Factors That Boost Construction Costs
 - 63 Fast-Sticking Latex Mortar Repairs Deck
 - 100 Views and Comments, by H. G. Nevitt
 - 112 Slag Mix Placed to Correct Slipperiness
 - 141 King-Sized Steel Arches

- Departments**
- 25 People
 - 33 Editorial (Down to Details on Job Quality)
 - 54 Meetings
 - 82 Job and Equipment Ideas

- Where To Buy It**
- 114 Return Postal Card
 - 114 New Products
 - 129 Manufacturers' Literature
 - 143 With the Manufacturers and Distributors
 - 131 Clearing House
 - 146 Index to Advertisers

FRONT COVER SCENE

Freeway overpass girders being set on US 16 near Muskegon Heights, Michigan. Using two Northwest cranes, L. W. Lamb Construction Co. walked the 35-ton units from flat car pickup to setting position. Steel fabricator, Paragon Bridge & Steel Co.





GOOD YEAR

UP FOR A BIG BID?

Let Goodyear keep
your tire costs down

FINDING THE WORK FACTORS—Goodyear Big-Tire Specialists are prepared to analyze your tire needs with an eye to keeping costs under control. These specialists will check the terrain, loads, climate, roads, schedules and speed problems that confront you, and can select the right Goodyear tires to help you solve them.

PUTTING BIG-TIRE KNOW-HOW TO WORK—From the world's greatest wealth of experience, Goodyear Big-Tire Specialists are uniquely qualified to help you. And they'll provide the best in tread and body designs to help safeguard your contract and your profits.

SETTING UP BIG-TIRE SERVICE—You say the word, and Goodyear Big-Tire Specialists will set up a tire-maintenance program at the job-site to help save you man-hours, machine-hours and useful tire life. In addition, Goodyear Contractor Service *will travel* with your job—handle all your tire maintenance and repair needs.

With BIG-TIRE PERFORMANCE
Example: SUPER HARD ROCK LUG

Here's one of Goodyear's Big Tires for the Big Bid you have coming up. It's the SUPER HARD ROCK LUG, built for heavy loads and no roads to make the going easy. Triple-tough 3-T Nylon Cord for the greatest tire stamina, plus new, special cut-shrugging rubber compounds, make this tire a real cost-saver in the roughest off-highway service.

For details on this and other Goodyear special-duty tires, and the Goodyear Contractor Service, see your Goodyear dealer. Or write Goodyear, Truck Tire Dept., Akron 16, Ohio.

Lots of good things come from

GOOD YEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

ROADS AND STREETS, January, 1961

... for more details circle 300 on enclosed return postal card

Winter...

*now is the time to properly
light your construction hazards*



**It's Winter... long
hours of darkness...
hazardous road
conditions!**

Protect the public and you
protect yourself. Proper light-
ing of your hazards may save
you thousands in tragedies,
bad publicity and lawsuits.

NEW! DIETZ HAZARD WARNING PLANNER

A Practical On-the-Job Tool! Quickly and
easily shows how, when, and where to use
each type of warning light for maximum
safety under all weather conditions and
all types of roads and speeds.



Send \$1.

for each Planner —
personalized with your name

R. E. DIETZ COMPANY
Dept. 81 Syracuse 1, N. Y.

**USE THE
DIETZ
3
WAY**

HAZARD WARNING SYSTEM



LANTERNS TORCHES VISI-FLASH

Use Dietz Visi-Flash Lights to alert the on-
coming driver. Brightest, safest, most
trouble-free flashers on the market. Warn:
"Danger Ahead" for up to 1500 hours
without changing batteries.

Use Dietz Lanterns to locate hazard in rela-
tion to driver's position. Show exact lo-
cation, shape, extent, and boundaries of
hazard area. Burn up to 100 hours.

Use Dietz Torches to guide driver around the
hazard. Fully illuminate the danger in
every weather. Burn up to 48 hours on
low cost kerosene.

Go DIETZ
and you go Safely

ROADS AND STREETS

Devoted to the design, construction,
maintenance and operation of high-
ways, streets, bridges, bridge founda-
tions and grade separations; the con-
struction and maintenance of airports.
Represents 69 years of continuous
publishing in the highway field; com-
bined with Engineering and Contract-
ing and Good Roads Magazines, estab-
lished in 1892.

HAROLD J. MCKEEVER, Editor-in-Chief
JAMES R. CUMMINGS, Associate Editor
DUANE L. CRONE, Washington Editor
DOUGLAS McDONOUGH, Assistant Editor
HELENA JUNG, Production Editor
BERNARD A. WEDELL, Products Editor
GEORGIA ZOGRAFOS, Editorial Secretary
H. K. GLIDDEN, **H. G. NEVITT**,
R. L. PEURIFOY,
Contributing Editors
CHARLES T. MURRAY,
Managing Editor Emeritus



Gillette Publishing Company
A Subsidiary of

**The Reuben H. Donnelley
Corporation**

Publication and Editorial Offices:
22 West Maple Street, Chicago 10, Ill.

Chicago Office: 22 West Maple St.
Superior 7-1581. **R. T. Wilson**, Gen. Sales
Manager; **Fred H. Bowes**, Representa-
tive; **E. Bender**, Clearing House Man-
ager; **J. L. Latta**, Production Manager;
L. R. Vickers, Circulation Manager; **A.
W. Lehmann**, Research Director.

New York Office: 15 E. 40th St., New
York 16, N. Y., Oregon 9-7750. **F. A.
Michel Jr.**, Eastern Manager.

Cleveland Office: Trace Building, 3100
Wooster Rd., Cleveland 16, Ohio, Edison
1-2267, **Ray Keine**, Manager.

West Coast Office: 1126 Del Rey, Pasa-
dena, Calif., Sycamore 4-6328, **J. A.
Osborne**, Manager.

Officers: **David L. Harrington**, Chairman
of the Board; **Gaylord Donnelley**, Vice
Chairman of the Board; **Curtiss E. Frank**,
President; **Edward A. O'Rourke**, Operating
Vice President; **Fred C. Ash**, Secretary-
Treasurer and General Counsel; **Karl G.
Clement**, Controller.

Gillette Publishing Company
HALBERT S. GILLETTE,
Vice President and Publisher

OTHER GILLETTE PUBLICATIONS

Rural Roads • Street Engineering
World Construction • Caminos y
Construcción Pesada

... for more details circle 290 on enclosed return postal card

STUCK IN THE MUD?



Mixing hydrated lime into saturated, swampy clay soil.



Same subgrade 4 hours later.
Note how soil is dry and friable.

For further information
and free literature—write



**NATIONAL LIME
ASSOCIATION**

925 15TH STREET, N.W.
WASHINGTON 5, D. C.



TRY LIME!

SPRING ROAD PROBLEM NUMBER 1:

After a long winter, there's the big backlog of road construction and maintenance—plus the inevitable spring breakup. Finally warm weather arrives but there is unworkable mud . . . and more mud after late spring rains. Valuable construction time is being lost! How to break this common bottle-neck?

HYDRATED LIME MAY BE THE ANSWER

Why Lime? Because it—

- 1 Dries up wet clayey soils.
- 2 Cuts plasticity sharply and makes soil much more workable.
- 3 Aids compaction.
- 4 Provides a base relatively impervious to subsequent rains—less reworking.
- 5 Greatly increases strength due to cementing action . . . forming a firm "working table".

This adds up to:

**EARLIER SPRING CONSTRUCTION (LONGER SEASON)
EXPEDITES CONSTRUCTION (LESS DELAY)**

Any doubts of this? Ask any contractor who has built lime stabilized roads.

**CONSIDER LIME FOR EXPOSED SUBGRADES AND
RECONSTRUCTION OF WORN-OUT ROADS WHERE
CLAY IS A PROBLEM . . . IT'S LOW COST TOO.**

. . . for more details circle 320 on enclosed return postal card

LUBE LOGIC

Five tips to

Texaco "lay-away plan" protects exterior of idle equipment

Equipment that won't be needed for a while is sometimes simply parked somewhere so nobody will fall over it. Well and good, but not enough—because rust and corrosion account for almost half of what you spend on equipment maintenance. Here's a 6-step program that

will keep idle equipment in cracker jack shape no matter how long it's out of use, or where it's stored. The basic ingredient is Texaco Rustproof Compound L—a remarkable product that keeps rust from starting, and acts to loosen rust that's already on the equipment.



1 Before applying Texaco Rustproof Compound L, make sure all exterior surfaces are clean and fairly dry.



2 Coat all adjustment bolts and other exposed threads with Rustproof Compound to facilitate removal or adjustment.



3 At temperatures of 65° or more, Texaco Rustproof Compound L can be applied to smooth accessible surfaces by brushing.



4 At temperatures below 65°F, or for inaccessible and complicated areas, spraying is the best way. You can thin the Rustproof Compound to a sprayable consistency by adding naphtha to form a 10 to 50% solution. Add the naphtha slowly to the compound and stir vigorously so the whole batch is the same consistency.



5 Apply tags at conspicuous points on the equipment describing the rustproofing measures that have been taken.



6 Thoroughly lubricate all equipment before storage.

Starting up equipment after storage



1 In most cases it's not necessary to remove Texaco Rustproof Compound L. You should, however, remove it from surfaces that will come into contact with personnel (such as ladders, seats and handles) and from surfaces that are heated to high temperatures when the equipment is operated.



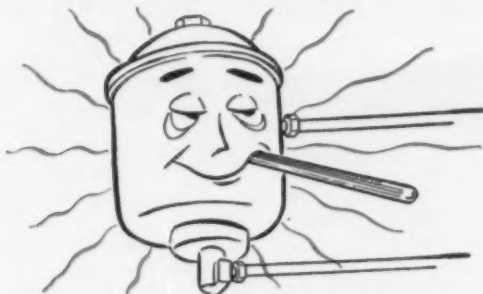
2 Since Texaco Rustproof Compound L is not a lubricant, all working surfaces and lubrication fittings should be wiped clean before use, and the correct lubricant should be applied before starting up.

Thicker oil won't stop gear-case drooling

You can't fix leaking seals on a gear-case simply by switching to a heavier-grade gear lubricant, because in gear cases carrying heavy loads, the thicker oil simply increases gear-case temperature, which thins out the oil and it starts leaking again. Sometimes,

however, foaming and leaking of gear-case lubricant indicates that the oil level is too high. By keeping vents open and keeping the oil at the recommended level, you prevent build-up of pressure which would cause leakage.

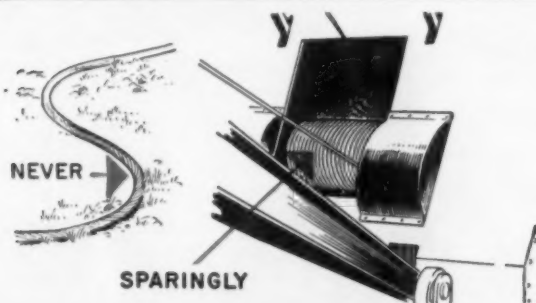
trim maintenance costs



A filter that's working runs a temperature

Oil filters last so long these days it's sometimes hard to say when they were last changed. But they're so important to engine performance that it's essential that you know whether they're too full to filter right. Here's a simple way to find out.

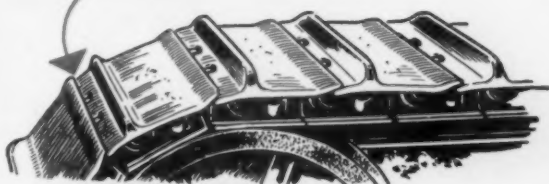
A filter that's working will be as warm as the engine oil. If the filter on a fully warmed-up engine remains cool to the touch, it's a safe bet that it's too clogged up to let any oil through. Just to double-check, tap the filter case sharply. A metallic ringing sound means the cartridge is still in good shape. A soggy thud often means that the filter is loaded. Top mileage for even the best filter is 6,000 miles, never more.



How often should you lubricate wire rope?

How much lubrication is good for wire rope and cable depends mainly on how it's used. Cables that are dragged in dirt shouldn't be lubricated at all. Oil simply holds the dirt where it can work into the strands and cause rapid wear. Cables that are wound on drums equipped with clutches should be lubricated sparingly to prevent fouling the clutch faces with lubricant. With other wire ropes, apply Texaco Crater A every 10 to 100 hours as necessary to avoid dryness. Be sure to clean the rope before adding new lubricant.

OIL CARRIES
DIRT INTO LINK



Crawler treads are happier dry

There are few places where good lubrication is more important than in track-roll bearings, but make sure you don't lubricate the crawler treads themselves in a burst of enthusiasm. The pins that connect the links of crawler treads are designed to operate without lubrication, because dirt or other abrasives would act as a lapping compound in service. Result: much shorter service life for the track. Moral: if you don't want to lap your crawler link pins, don't oil them.



TEXACO LUBRICATION ENGINEERS

Every month or so we'll bring you a batch of "sleepers," little angles, so easy to overlook, where big savings in money and time can be made. But month in, month out, your local Texaco Lubrication Engineer is the best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control."

Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

Tune In: Texaco Huntley-Brinkley Report, Mon. Through Fri.-NBC-TV

TEXACO

Throughout the United States

Canada • Latin America • West Africa





"Best rigs for my money—they're doing an excellent job," says R. E. Robertson, superintendent of excavation for Montag-Halvorsen-McLaughlin & Associates on the John Day Lock and Dam project near The Dalles, Oregon. He's talking about his seven DW20Gs with Athey PW20 Wagons, carrying

112,000 lb. shot rock or glacial gravel. Five of the DW20Gs stockpiled 100,000 cu. yd. in three weeks. Day after day they make 185 three-mile round trips, pulling big loads at 32 MPH. Says Master Mechanic Huey Long, "These DW20Gs are built to stay on the job."



"These DW20Gs are really hauling sons-o-guns. We've got over 600 hours (in just two months) on them and they're doing great. And this SynchroTouch is undoubtedly the coming thing—only it's here now." This is the way R. A. Heintz describes the five DW20Gs with 482B Scrapers on Heintz & Rogers' railroad relocation project around Ice Harbor Lock and Dam in Walla

Walla County, Washington. The tractor-scrappers handle both belt-loading and push-loading tasks. The versatility of these tractor-scrappers has been augmented by sideboarding for easier top loading. Hauling 25 yards of bank run gravel, the DW20Gs move 240 loads every eight hours, cycling in four minutes on the $\frac{3}{4}$ -mile haul.

MORE LOADS MOVED MORE PROFITS EARNED WITH CAT DW20s

versatile and dependable

Look at the big jobs—where high, continuous production is a must! John Day Lock and Dam: 3,700,000 yards—Cat DW20G Tractors with Athey PW20 Wagons for prime movers. Railroad relocation for Ice Harbor Lock and Dam: 6,500,000 yards—another Cat DW20G-482B Tractor-Scraper job.

Put this versatile, dependable DW20G on your job and watch its top performance on all conditions, month after month! Its 345 HP (maximum output) Cat Diesel Engine quickly speeds it to top 35.8 MPH, cutting precious seconds from cycle time. Big power takes it up grades fast, keeping production on schedule. With interchangeable 27 cu. yd. (heaped) Cat 456B or 34 cu. yd. (heaped) 482B Scrapers or 40-ton PW20 Wagons (built by Athey Products Corporation), it loads fast—hauls fast—dumps fast. See your Caterpillar Dealer for on-the-job proof of this versatile, dependable DW20G.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.



TOUCH AND GO SHIFTING WITH SYNCHROTOUCH Optional Synchro-Touch Transmission Control lets operator dial desired gear, combining split-second shifting with economical direct drive transmission. DW20G with SynchroTouch means faster shifting for faster cycles, more big payloads per hour, and reduced operator fatigue.

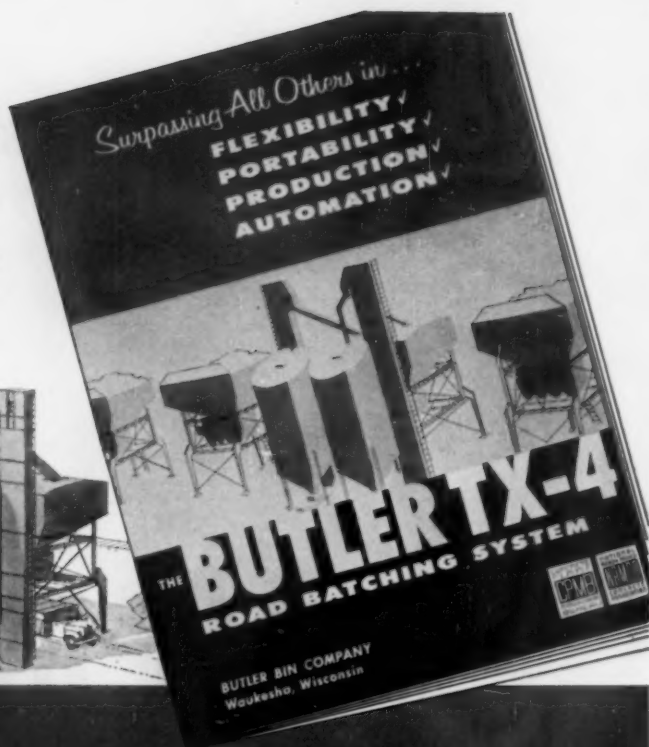
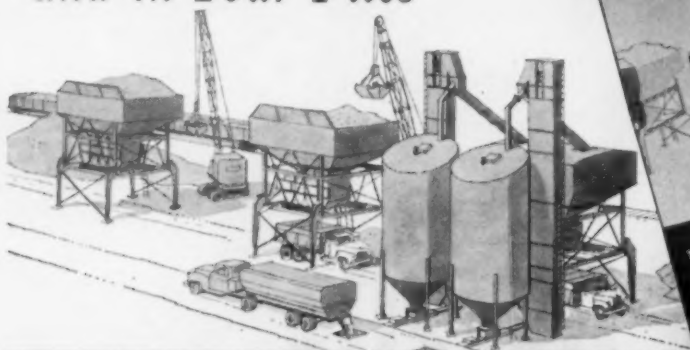
CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**POWERFUL DW20G
FOR PROVED PERFORMANCE
ON THE BIG JOBS**

... for more details circle 282 on enclosed return postal card

*As a Highway to
Positive Profit...You'll
Want This New Butler
Bulletin on Your Desk
and in Your Files*



THE TITLE?

"Surpassing All Others in ...

**FLEXIBILITY...
PORTABILITY...
PRODUCTION...
AUTOMATION...**

**The BUTLER
TX-4
Road Batching
System"**

... And truer words were never written.

The Bulletin is technical, completely illustrated and diagramed in construction and engineering details as well as in operational procedures. It's conservatively factual and practical as a dictionary.

These same facts make clear why the Butler TX-4 holds every known world's record for batching speed ... why the TX-4 adds a surprising "plus" in profits because of fast dismantling, transport and re-erection ... and why only one operator, through Butler Automation, triggers the highest, split-pound precision in control of all batch ingredients.

So — now, while you're thinking of it, write for your copy of the new Butler TX-4 Bulletin. A postcard will get prompt results ... So will the coupon below. The choice is yours — but do it now before your busy day crowds it from your mind.

BUTLER BIN COMPANY, Waukesha, Wisconsin

Please send (One ☐; two ☐) copies of the new Butler TX-4 Bulletin to

NAME _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____

MY TITLE IS: _____

**BUTLER BIN
COMPANY**

959 Blackstone Ave.
Waukesha, Wisconsin

... for more details circle 336 on enclosed return postal card

Concrete Adhesives With THIOKOL Liquid Polymer MAKE LITTLE OF BIG REPAIRS



1. Scaled highway surfaces are being lastingly repaired in only a few hours by bonding new concrete to old with adhesives containing THIOKOL polysulfide polymer. The bond is stronger than concrete itself. Field and lab tests prove it.



2. Only loose and damaged concrete—not the whole slab—need be removed. The adhesive also cuts time and costs in repairing spalled areas, cracks, pot holes, in skidproofing and sealing, in fastening traffic markers. Results are long-lasting.



3. Adhesive with THIOKOL liquid polymer—made and sold commercially by several processors—is spread on prepared surface with brooms or heavy brushes. Thirty minutes later, while adhesive is still tacky, new concrete is poured.



4. Concrete is laid conventionally. It can also be worked out to a feather-edge without danger of later failure—so tenacious is the adhesive bond of new to old concrete.



5. Repair completed—road open as soon as concrete is cured. Similar repairs, in service since 1953, show no damage or effects of weather, wear and tear, even on the busiest highways.

®Registered trademark of the Thiokol Chemical Corporation for its liquid polymers, rocket propellants, plasticizers and other chemical products.

Thiokol®

CHEMICAL CORPORATION

780 NORTH CLINTON AVENUE • TRENTON 7, NEW JERSEY

In Canada: Naugatuck Chemicals Division, Dominion Rubber Co.,
Elmira, Ontario

FOR MORE INFORMATION: Mail Coupon to Dept. CA-55
Thiokol Chemical Corp., 780 N. Clinton Ave., Trenton 7, N. J.

Please send me THIOKOL'S helpful booklet "A New Type of Concrete-to-Concrete Bonding." Tells how to reduce remedial time and costs, and to keep roads in service.

Name

Firm

Street

City Zone State

... for more details circle 329 on enclosed return postal card

All-wheel drive and



the TS-14 "Euc" is in a class by itself!

No matter what your scraper requirements may be — small yardage work for land conservation, secondary roads etc. to the biggest projects — the Euclid TS-14 can cut your earthmoving costs.

Here's performance and overall work-ability in a medium size scraper — 14 yds. struck and 20 yds. heaped — that's way ahead of any scraper of comparable capacity. With two engines (296 total h.p.) and separate Torqmatic Drives for each axle, the TS-14 gets a heaped load in a hurry . . . gets out of the borrow pit or cut fast . . . and highballs on the haul road. It can self-load in practically any

material, and with a pusher it's a big producer on the toughest jobs.

If you want a one-man earthmoving spread that can work more days per year . . . that handles a wider range of jobs and isn't stalled by steep grades and adverse conditions . . . ask your dealer for the new catalog No. 555 or better yet, have him show you one in operation.

EUCLID Division of General Motors
Cleveland 17, Ohio

*Plants at Cleveland and Hudson, Ohio
and Lanarkshire, Scotland*

greater versatility...



- **Twin-Power ... a Euclid exclusive**
- **Hydraulic scraper operation**
- **Proven planetary drives**
- **One-man earthmoving spread**
- **Greater service accessibility**



*All-wheel drive "Twins"
give you a longer, more
profitable work season*



EUCLID

FOR MOVING EARTH, ROCK, COAL AND ORE

THE USEFULNESS OF A



HOW TO KEEP A JOB ON SCHEDULE

You need machines that work...and *keep* working! Nothing's more useless than a shovel or crane that's "down" when you need it most. Limas have a reputation for staying on the job. They're predictable because they *do* the work you schedule for them. You can count on them. Limas are better built, better engineered for dependable high production, trouble-free operation; favored by users everywhere to outdig, outlift and outlast other makes. Lima quality features include:

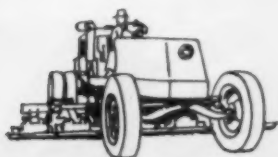
- Precision air control—insuring maximum production under the most adverse conditions; permitting feel of the load, instant response.
- Antifriction bearings at all important bearing points, including drums, brake and clutch housings.
- All gears, smaller parts and shafts are flame or induction hardened for longer life.
- Versatility—insuring *plus* value. Limas are not adaptations of single-purpose machines. Each is designed and built for top efficiency, long life with any front end.
- Design flexibility assuring complete transportability; easily dismantled to legal weights.

Call your Lima distributor and arrange to see a Lima at work. Or write us for details.

6T01



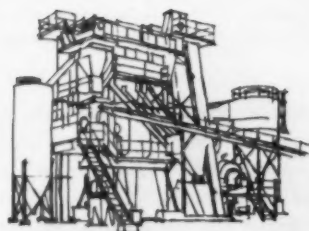
There's a Lima type and size for you—shovels to 8 yd.; crawler cranes to 140 tons, truck cranes to 80 tons, wagon cranes to 75 tons; draglines variable. Interchangeable front ends. Gasoline, diesel or electric power.



LIMA MODEL D ROADPACKER
—Six vibrating shoes consolidate fast, deep for profitable single-course construction; available in 12-shoe Super model.



LIMA AUSTIN-WESTERN portable and stationary crushing, screening and washing equipment; including jaw crushers, roll crushers, feeders, screens, elevators, conveyors, bins.



LIMA MADSEN ASPHALT PLANTS
—available in models with batching capacities from 1000 to 10,000 lb.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division • Lima, Ohio
BALDWIN • LIMA • HAMILTON



... for more details circle 311 on enclosed return postal card
ROADS AND STREETS, January, 1961

How 4-in-1 Fleet Owners cash in on "MULTI-MACHINE" utility...



7-unit owner, Riemer Brothers, Inc., Schiller Park, Illinois, handle sizeable contracts over the midwest with International Drott 4-in-1's. Says President George Riemer: "Each dollar we have invested in 4-in-1's does the work of several dollars in 'big-ticket' machines to do all a 4-in-1 does—ably and profitably." Riemer Brothers save up to 90% on hand labor cost on fine grading work—with 4-in-1 "carry-type scraper" working accurately!

Who better than fleet owners would know what it means to command International Drott 4-in-1 "equipment fleet" performance. Compare for yourself the big advantages of getting the built-in utility of bulldozer, clamshell, excavator-loader, and "carry-type scraper"—in one machine, one-man-operated! Let your International Drott Distributor demonstrate!

8-unit owner, Lark Shrader, Los Gatos, California, credits much of his business success to 4-in-1's. "My competition uses ordinary limited purpose tractor loaders, while our International Drott 4-in-1's can do almost anything," states Mr. Shrader. "We charge more per hour, and have a customer waiting list!" Here one of Mr. Shrader's TD-9 rigs shows exclusive 4-in-1 clam-action bottom-dumping, that eliminates the sticky materials problem!

5-unit owner, Zachary & Brown, Abilene, Texas, bank on International Drott 4-in-1 capacity and versatility for speeding construction of Atlas Missile silos. After "shooting" loose a 5-foot depth of rock, contractor lowers a TD-9 Four-in-One into the hole—to dig and load the material into a big dragline bucket. The circular holes are dug 56 feet in diameter, 180 feet deep. Contractor can "clam-handle" big rocks; bulldoze; grade; apply "power-shovel-like" break-out force—only with the 4-in-1's!



International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin



INTERNATIONAL® DROTT®

... for more details circle 302 on enclosed return postal card

ROADS AND STREETS

Sixty-Eight years of Editorial Leadership

Washington News Letter

By Duane L. Cronk, Director, Highway Information Services

January 10, 1961

The appointment of Rex Whitton to the post of Federal Highway Administrator has drawn the very best kind of reaction here in Washington. The capable, conscientious chief engineer of the Missouri State Highway Commission is a veteran of 40 years experience in highway engineering and administration. As president of the American Association of State Highway Officials a couple of years ago, he won the respect of Congressmen and Senators as well as the roadbuilding industry. Throughout the last two months of speculation over who would win the nation's top highway post, his name has been on the list of everyone whose recommendations have been sought by the incoming Administration.

Mr. Whitton's work will be cut out for him. As chief of the BPR, he will be expected to administer the huge multi-billion-dollar federal aid programs, help rekindle the confidence of the public in the merits of the much maligned undertaking, and stimulate Congress with a proper appreciation of the necessity for a complete rebuilding of the financial substructure supporting the Interstate program.

* * *

This month will see the release of the long-awaited BPR studies on highway cost allocation and the new estimate of the cost to complete the Interstate network. The former, generally referred to as the "Section 210 Study," will provide data with which Congress can determine who should pay for new roads and how much (including for the first time, non-users). Results of the AASHO Road Test will follow within a few weeks.

Meanwhile, the roadbuilding industry's program for re-selling the general public on the need for and benefits of better highways has picked up wide support. Teams of contractors, equipment distributors and other industry leaders have raised well over \$300,000 to finance the Better Highways Information Foundation's public education campaign. "Good roads" groups in several dozen states are working with their highway departments to implement local booster programs.

The drive is drawing considerable support from state and community businessmen. In some areas, Chambers of Commerce are the first to recognize that the health of their production, distribution and merchandising operations depends upon clearing the transportation lifelines. Last month, also, the U.S. Chamber of Commerce released a comprehensive review of the national highway program and strongly urged the business community to support it.

Highway engineers, drawn into the complexities and controversies of urban planning through their responsibilities in metropolitan areas, are rightly disturbed by the spread of misleading statements that highways cannot meet the

(continued on next page)

transportation needs of cities. Rail transit apologists have been most guilty of disseminating "half-truths" applicable in only a handful of American cities and only under special conditions. An example is their statement that it would take 20 lanes of expressway to carry as many passengers as one rail line could transport. They derive this comparison from the much-publicized theory that a rail line can carry 40,000 passengers per hour compared to 2,000 vehicles per lane of expressway.

Of course, it is unfair to compare passengers to vehicles, especially when automobiles on a heavy-duty expressway carry an average of 1.8 passengers each. A direct comparison of passengers to passengers would slash the much-touted 20-lane requirement to 11.

But this is still a poor comparison, for it is still comparing theoretical capacity of a rail line to actual performance of expressways. The theoretical capacity of the private automobile is 5 passengers and a 4-lane expressway carrying 2,000 such vehicles per-lane per-hour could match the rail line's 40,000. Admittedly, commuters do not want to share-ride to that capacity. But the fact is the 40,000 capacity of rail lines would be as difficult to attain in all but six to eight of the nation's nearly 200 metropolitan areas. Yet, highway engineers are being thrown onto the defensive by such a statement that is used against expressway programs in scores of other cities.

* * *

Actually, a four-lane expressway - with minor design provisions to permit fast express buses - can carry the traffic loads foreseen in the great majority of our cities and through literally hundreds of commuter corridors. Just as important, the roads will be there to carry the huge flows of traffic spread out over the non-peak hours and Sunday - traffic which could not be enticed onto rail lines - salesmen, shoppers, truckers, and families enroute to recreational sites.

The pseudo-experts who are throwing the 20-to-1 figure at the highway engineers, and who would force a decision for rail transit solely on its theoretical ability to carry peak-hour traffic, are overlooking the total transportation needs of their communities. And they are ignoring forces of decentralization which every year strengthen the case for flexible transportation systems - both private and public.

This is one of the most controversial arguments to find its way to Washington this year, for the problem of urban transportation is one of several metropolitan problems the new Administration is philosophically and politically committed to tackle. The next few weeks will see the federal government take steps into territory heretofore reserved for state and local action. Here is where the highway program will be most severely attacked and sometimes with such superficial statistics as the "20-to-one."


Most of the planners coming into power will be from the handful of large Eastern cities, where rail transit merits polite consideration, at least. Hence they cannot be expected to realize that highways may very adequately serve Des Moines, Iowa. Look for a complete reappraisal of the highway program in urban areas.

Off the cuff . . . The Department of Commerce announced last month that it is studying a liberalization of the outdoor advertising ban. . . The Department has OKed the newly approved Manual on Traffic Control Devices. . . State highway user tax revenues climbed 5% last year, to \$5.3 billion. . . A new Highway Safety Board has been established to coordinate the traffic safety research programs of the various federal agencies.

Profit-Preview...

**Here's the equipment
you'll see on the**

MONEY-MAKER JOBS IN 1961

**You'll see TOP profits
earned on jobs
working  Tandems**

Introduced just a year ago, Le-Tourneau-Westinghouse "2-loads-per-trip" Tandems are now being used in every kind of material, and on short hauls as well as long. With good reason: by operating *two* scrapers behind a Tournapull® or Speedpull® prime-mover you *double* your load capacity at *only* 1/4 extra cost for the second scraper. Job use also proves that: you can add or take off the second scraper in *minutes*, to meet changing job conditions . . . you turn, back up, and maneuver as simply as with single scrapers, and in almost the same space. Visibility is *excellent*, of both loads, both aprons, and pusher.



ONE pusher is all you need, and it can be the same size you'd use with ONE scraper-operation! Investigate tandems (18 to 58 yds) . . . LW engineers will help you figure how they will "prove out," and in what tandem combination, on jobs you'll be bidding in 1961.

**For more previews
of the 1961 profit picture,
turn page.**

1961

Profit-Preview...

You'll see V-POWER TOURNAPULLS®

...like this
all-purpose C 'Pull*
...“hottest” scraper
on the market

V-Power C 'Pull, with 270 hp, 27-mph speed, saves time on *every* phase of its cycles. Main reason: a 20% better power-to-weight ratio than average in its size-class! Other reasons: fast-loading Fullpak® scraper (14 yds struck, 20 yds heaped) . . . smooth-shifting, wide-ranged step-gear transmission . . . instant-response electric steer and scraper control . . . LW Power-transfer differential. Easiest of all earthmoving machines to maintain. Add on second scraper any time for LW Tandem operation . . . or interchange scraper with 22-ton LeTourneau-Westinghouse Rear-Dump.

*Trademark



On long-haul jobs you'll see SPEEDPULLS®

There's a good reason for C Speedpull's high production on long-haul projects. With 276 hp, it has the best power-to-weight ratio in its size class . . . power for fast acceleration . . . power to operate *two* 20-yd Fullpaks in tandem. 37.7 mph speeds. Hydrair® suspension levels the ride, eliminates need for front axle. No troublesome axle “dozing” action. LW Power-transfer differential keeps you moving over rough grades, wet, slippery footing. Positive power-steer for quick turns, easy maneuvering. Result: you move *more* earth at lower cost!



setting new yardage records in 1961



...and the
big-production "B",
top money-maker
of them all!

Best combination of *price, capacity, and power* available in big scrapers. GM 12V-71 engine delivers 430 "horses." With extensive use of super-strong but light-weight steel, this gives you a low 320:1 power-to-weight ratio, WAY ahead of the industry. Result: you get more "snap," faster positioning, easier loading, high-ball hauling... *higher production no matter how tough the job.* Powerful enough to operate TWO 29-yd scrapers in tandem; low-cost enough to prove-out dollar-wise with *any* combination of 20 or 29-yd scrapers, or with interchangeable 35-ton Rear-Dump.

...and on any job, economy-size D 'PULLS



The 143-hp D 'Pull, with 9-yd scraper or 10-yd Hancock elevating scraper (shown), is probably the most useful earthmover built. On *big* yardage contracts, you'll see the "D" on finish, shoulder, and clean-up jobs. On *small*-yardage work, it can be roaded without permit, work by itself. With Hancock scraper, you do *not* need a pusher to get heaped loads. Scrapers interchange with 11-ton Rear-Dump.

For more profit-
previews, turn page...

1961 Profit-Preview, continued...

On every size and type of job you'll see...

"Go-Anywhere" LW Tournatractor® ...with 218 hp, 18.5-mph speed

Rolling on big rubber tires, mobile Tournatractor is on the job, *producing*, before you can load a crawler tractor on a low-boy! It *works fast*, too, with non-friction drive for acceleration pep, with sharp-turn maneuverability, and a torque-converter transmission speeding *every* operation. Power? In speed ranges where most tractor work is done, it matches big crawlers in rimpull, pound for pound. New: *choice* of Tournatractors, with electric or hydraulic blade control.



"Go-Power" LW Graders...7 sizes from 85 to 190 horsepower

More proven performance-advantages than any other grader on the market! Strongest frame built, with high arch for more blade clearance...63" circle and *positive* blade control...8 forward speeds, 4 reverse, 3 optional creepers for maximum power application (two torque-converter POWER-Flow® models offer *infinite* speed ranges)...GM or Cummins engines...full-sweep visibility of both blade-ends and road ahead...and a *wide* range of profit-boosting attachments, including Preco automatic blade control.



HAULPAK®: the truck you can tell is built by a construction- equipment manufacturer

Designed to *earthmoving* "specs," not automotive! You get: LW Power-transfer differential...traditional Tournapull ruggedness in frame, axles, bull-gears, etc. *New* ideas, too: "no-spring" Hydrair® suspension...deep V-bowl that carries *more* load *lower* for best stability...built of steel 3 times stronger than standard, yet 1/2 lighter. You haul much more payload than Haulpak weighs! 5 sizes, 22 to 60 tons, for *lowest net cost per hauled ton* on every job.



People

H. A. Sawyer Chairman Cement Association

H. A. Sawyer, chairman and president of Lone Star Cement Co., New York, N.Y., was elected Chairman of the Board of Directors of the Portland Cement Association. He succeeds Cris Dobbins, Ideal Cement Co., Denver.

Five new PCA directors also named: L. E. Bayer, National Cement Co.; R. M. Craigmyle, Giant Portland Cement Co.; H. R. Schemm, Huron Portland Cement Co.; Charles E. Shearer, Keystone Portland Cement Co. and Paul Sunderland, Ash Grove Lime and Portland Cement Co.

Five directors re-elected: Richard A. Grant, Arizona Portland Cement Co. and California Portland Cement Co.; Robert E. Pflaumer, American-Marietta Co.; R. D. Raff, Diamond Portland Cement Co.; Ellery Sedgwick, Jr., Medusa Portland Cement Co.; and W. S. Ziegler, Saskatchewan Cement Co., Ltd., and Inland Cement Co., Canada.

Mr. Sawyer, a civil engineering graduate of Texas A & M College, has a broad background of varied industry leadership. He is a life member of the American Society of Civil Engineers, a director of the American Mining Congress, and chairman of its advisory committee for the cement industry.

ANATOL A. EREMIN, associate bridge engineer, California division of highways, has retired after 32 years with the division. Among the California structures he designed are the Peninsular Avenue Overcrossing on the Bayshore Freeway in San Mateo (first single-column bent bridge in the state), the Waldo Tunnel north of San Francisco (one of the largest U.S. vehicular bores), the University Avenue Overcrossing on U.S. 395 in San Diego (state's first concrete box girder bridge), and other notable structures. Eremine has written numerous treatises on civil engineering subjects and is the author of three engineering books.



H. A. Sawyer (right) newly elected chairman of the Portland Cement Association, is congratulated by G. Donald Kennedy, PCA president, at the Association's 1960 annual meeting.



E. W. Records presents award to J. R. Bromley

E. W. RECORDS, chairman of the Wyoming highway commission, presents a 40-year service award to J. R. Bromley, department superintendent and chief engineer. Mr. Bromley has served in his present capacity since 1944 and has worked for the Wyoming highway department since 1918. He is a past president of the Western Association of State Highway Officials.

GEORGE J. TUPAC has been appointed division engineer of the National Corrugated Metal Pipe Association, as announced by Roy E. Smith, managing director. He will have headquarters at Los Angeles, serving as an advisor in the use of corrugated metal pipe drainage structures in the engineering, design and construction of projects requiring drainage materials.

Continued on page 30

Save on construction costs with the new '61 FORD TRUCKS

SAVE FROM \$31 TO \$157 ON PRICE* ALONE WITH FORD'S F-100 STYLESIDE PICKUPS

Contractors everywhere are finding that the half-ton Ford Styleside is priced below all other comparable pickups! And these rugged pickups are designed to keep right on saving with lower maintenance and operating expenses. Their durable, one-piece cab-and-box construction provides increased rigidity and eliminates a major source of rust and corrosion. Not only does the sheet metal last longer with this stronger body, but it also contributes to a quieter ride.

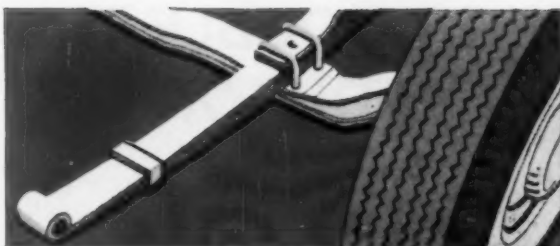
And you can save more . . . because you can carry more on every trip. Styleside bodies are longer and wider with loadspace increased as much as 16%. In addition, wheelbases have been lengthened 4 inches and this combined

with the improved shock absorbers gives a ride that's unexcelled in its field—proven by scientific Impact-O-Graph tests. For construction work the angle of approach has been increased so you can climb steeper drives or go over deeper ditches or gullies. Ford also offers America's lowest-priced* 4 x 4 with big 8-ft. box, the F-100 Flareside.

And you can save on operating expense! Ford's Mileage Maker 223 Six is standard on all conventional pickups to keep gas costs low. The economical 292 V-8 is available for jobs requiring extra power. Both engines are equipped with Ford's Full-Flow oil filter that lets you get 4,000 miles between oil changes.

*Based on a comparison of latest available manufacturers' suggested retail delivered prices





SAVE UP TO \$150 ON FRONT TIRES! In certified tests of truck suspensions, Ford front tires lasted up to twice as long. In 50,000 miles, savings can add up to \$150 on a pickup . . . more on two-tonners. And Ford's sturdy I-Beam front axle and leaf-spring suspension not only cut tire wear, but their simpler design also cuts maintenance costs.

12,000 MILE OR 12 MONTH WARRANTY

SAVE WITH GREATER DURABILITY . . . on all 1961 Ford Trucks, each part, except tires and tubes, is now warranted by your dealer against defects in material and workmanship for 12 months or 12,000 miles, whichever occurs first. The warranty does not apply, of course, to normal maintenance service and to the replacement in normal maintenance of parts such as filters, spark plugs and ignition points. Never before have you had such protection . . . such evidence of long-term economy!

SAVE WITH FORD'S NEW 262-CU. IN. "BIG SIX" ALL-TRUCK ENGINE FOR TOP PERFORMANCE AND ECONOMY

America's savingest two-tonners offer a big 262 Six with the power of big displacement, the gas economy of 6-cylinder design, plus the durability of heavy-duty construction. This engine features a sturdy stress-relieved block, strong forged steel crankshaft, long-lasting stellite-faced intake and exhaust valves, and durable pyramid-type connecting rods. And Positive Crankcase Ventilation reduces oil dilution and sludge formation to extend engine life. Ford's proven 292 V-8 and 292 HD V-8—the V-8's with "six-like" economy—are also available for your special power needs.

You also save with other new durability features like the more rugged frame, stronger radiator with new lock-seam construction, improved cab and chassis electrical wiring, plus longer, easier-riding and more durable rear springs. Ford's parallel ladder-type frame with standard 34-inch width allows you to install new or transfer your present special construction bodies quicker and for less. Also, the frame drop in the cab area lowers cab height . . . makes for easier entry.

NEWS OF MORE SAVINGS FOR HEAVY CONSTRUCTION WORK . . . ►

Save on construction costs with the new '61 FORD TRUCKS

FORD HEAVIES SAVE WITH DOUBLE THE CAB, SHEET METAL AND RADIATOR LIFE

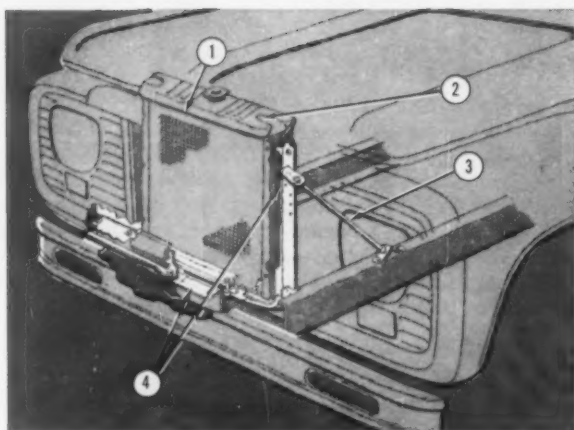
Ford F-Series Heavy Duty models are especially designed for the rugged terrain and tough conditions generally found on construction jobs. Their new independent mounting system for cab and radiator effectively separates both from adjacent sheet metal assemblies for much greater durability. And radius rod-leaf type rear springs provide better axle alignment, a smoother ride and longer spring life.

The electrical wiring system has been improved for greater reliability. Chassis wiring is fastened within the protection of the frame web, away from mud, ice and snow. And Ford Truck frames have been engineered to make the mounting of bodies and special equipment easier. A new 212-inch wheelbase model is available to accommodate extra-long bodies.

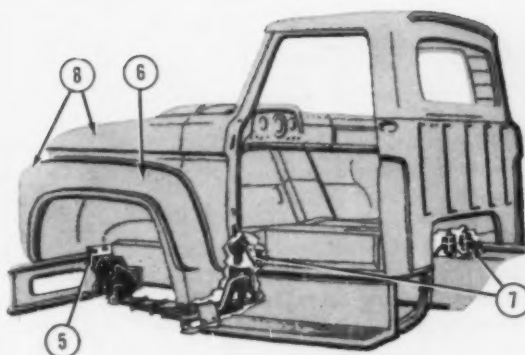
Save with Ford T-Series Heavy Duty Tandems for exceptional durability, big payloads and low operating expenses. Ford T-700, T-750 and T-800 Tandems have rugged double-channel frames that are built to take tortuous off-road treatment. And they provide a wider range of chassis options so you can choose the right power train and load-carrying components for any job. Eaton and Timken rear axles are now available in bogie assemblies with 22,000-, 28,000-, 30,000- and 34,000-lb. capacities. And lightweight aluminum walking beams, wheels and gas tanks are available to keep chassis weights low . . . payloads high.

Ask your Ford Dealer about Ford's full tandem line . . . including Super, Duties with 38,000-lb. bogies for up to 51,000-lb. GVW!

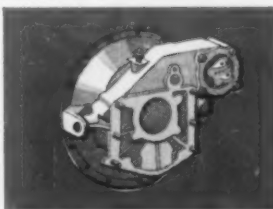




- ① **Save with Ford's exclusive "lock-seam" radiator construction** that doubles the solder area at key seams for greatly increased strength and longer radiator life.
- ② **Save with heavier-gauge metal on radiator tank and header.** Tanks and header have thicker walls to resist vibration, jolts and corrosion for greater reliability.
- ③ **Save with independent radiator mountings,** separate from front-end sheet metal. This means that road shocks and shakes are not transmitted to the radiator through sheet metal . . . tanks, tubes and connections last longer, require less maintenance.
- ④ **Save with "horse collar" mounting** for extended radiator life. This new mounting on resilient rubber at the center of frame cross member soaks up any frame flexing . . . cuts wear and tear on entire cooling system.
- ⑤ **Save with independent fender mountings.** Fenders are bolted to a rubber-cushioned transverse bracket at the front and a frame-mounted bracket at the rear. This mounting, independent of both cab and radiator, eliminates stress transfers for increased fender life.



- ⑥ **Save with removable fenders.** The quick and easy removal of only 8 bolts per fender provides faster service accessibility to the engine area, saving valuable maintenance time.
- ⑦ **Save with new 3-point cab mounting system** for greater cab durability. Two outboard front mounts plus a centered "twin" rear mount provide a triangular system that holds the cab stationary while allowing the frame to move independently . . . reducing strain on the cab.
- ⑧ **Save with 42% heavier-gauge sheet metal** in fenders, hood, cab floor pan and toeboard for greater strength, greater durability.



Save with Ford's new Full-Torque flywheel power take-off . . . now available on T-750's and up, to power construction equipment like transit mixers. It's much simpler and more efficient than long, complicated hookups needed with the front-end drives. And the flywheel PTO is lighter in weight—only 105 pounds—for greater payloads.

FORD TRUCKS COST LESS

YOUR FORD DEALER'S "CERTIFIED ECONOMY BOOK" PROVES IT FOR SURE...

FORD DIVISION, *Ford Motor Company*.



People

Continued from page 25

Nevada Road Department Veterans Honored

Highway service totaling over 1,000 years was honored recently when the Nevada department of highways presented awards to 49 veteran employees. G. F. Armstrong, maintenance superintendent, at Reno, and J. A. Glock, district engineer, Elko, led with 40-year certificates. Others ranged in tenure from 35 to 15 years.

ASCE Life Members

Life membership in the American Society of Civil Engineers was bestowed on eleven Chicago area engineers at a recent meeting of the Society's Illinois Section.

The recipients were: Hugh Barnes, asst. vice president, Portland Cement Association; Robert A. Black, chief engineer, Chicago Park District; Leonard C. Childs, presi-

dent, Battey and Childs, consulting engineers; George O. Consoer, partner, Consoer Townsend & Associates, consulting engineers; Herbert S. Grassman, consulting engineer; G. Donald Kennedy, president, Portland Cement Association; Lenox R. Lohr, president, Museum of Science and Industry; E. E. Michaels, chief executive officer, Chicago Bridge & Iron Works; Payson A. Perrin, Robert J. Smith, MacDonald Engineering; and Robert W. Wallace.

GUY F. ATKINSON, Chairman of Guy F. Atkinson Company, contractors, of South San Francisco, California, has been made an honorary member of the American Society of Civil Engineers. One of the few construction engineers ever named to this honor by ASCE, Atkinson has served almost 70 years in heavy

construction business, in the fifth generation of a line of construction contractor family people. His firm is one of the nation's largest. Other new honorary members of ASCE include Solomon C. Hollister, Dean of Engineering at Cornell University; and Frank Kerkes, Dean, Michigan College of Mining and Technology; and Fred C. Scobey, consulting engineer, Berkeley, California.

EARL J. FELT, manager, transportation development section, Portland Cement Association, Chicago, died recently at age 52. Felt served the Association from 1935 except for a brief wartime period. As a development engineer during the prewar years he took part in the pioneering work which brought soil-cement out of the laboratory as a road building material.

BUILDING BETTER PROTECTION FOR YOU



For a solid foundation of protection, rely on Builder's Risk Insurance written by National Surety Corporation — a company backed by the *Fund of Experience*. Ask your independent agent or broker to outline the benefits of each form of Builder's Risk Insurance: Course of Construction . . . Completed Value . . . Reporting. The *right* form can mean savings for you when you insure with National Surety Corporation.

NATIONAL SURETY CORPORATION

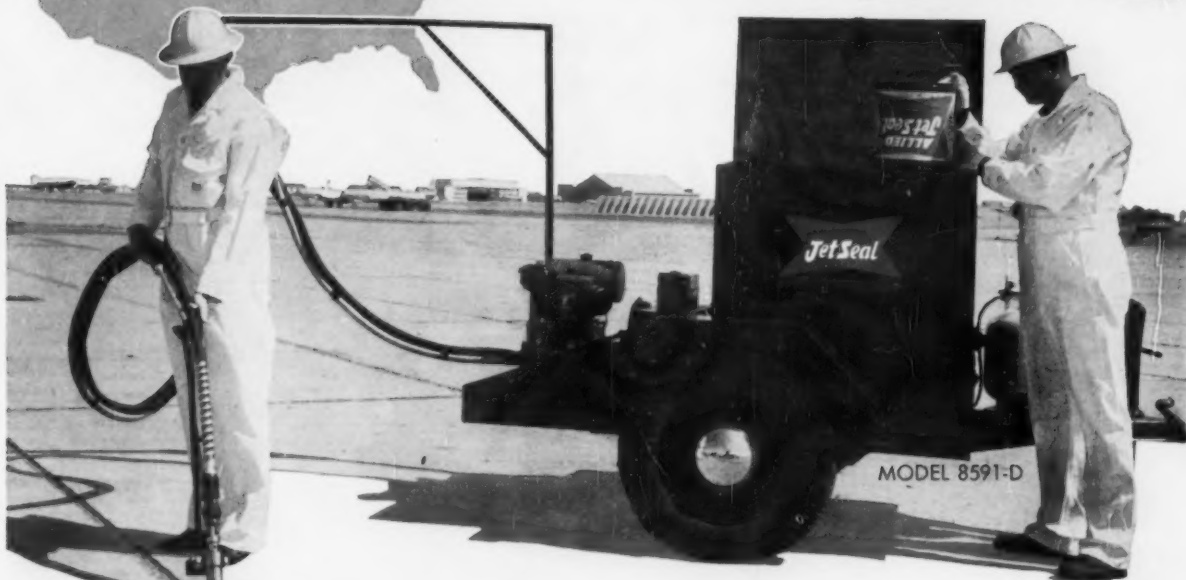
Central Bonding Offices:
3333 CALIFORNIA STREET, SAN FRANCISCO
110 WILLIAM STREET, NEW YORK
Branch Offices in Principal Cities in America



The
FUND
Insurance Companies
FIREMAN'S FUND INSURANCE COMPANY
HOME FIRE & MARINE INSURANCE COMPANY
NATIONAL SURETY CORPORATION

... for more details circle 293 on enclosed return postal card

***PROVED!
ACROSS THE NATION... ALLIED Jet Seal®**



THE SUPERIOR JOINT SEALANT

JET SEAL APPLICATORS OFFER FAST, EFFICIENT OPERATION

The Allied-Stroud Applicators, Model 8591-D (shown above) and the NEW COMPACT Applicator (Model X691-E) offer the most efficient and complete method of joint sealant application for any sealing job.

Manufactured by Allied-Stroud Corp., a division of Allied Materials Corp., the Allied-Stroud Applicators are the ONLY sealant application equipment authorized for the application of Allied JET SEAL (Products 9015H Highway, 9015M Military, 9015T Hydraulic).

For complete detailed information about the Allied-Stroud Applicators and Allied JET SEAL, the Original two-component, polysulfide, polymer, elastomeric joint sealing compound, write to:

USED IN MAJOR PROJECTS EVERYWHERE (Partial List)

- Los Angeles Internat'l Airport
- Yuma Naval Air Station, Arizona
- O'Hare Internat'l Field, Chicago
- New York Internat'l—Idlewild
- Miami Internat'l Airport
- Niagara Power Project
- New York State Thruway
- Tennessee Highway Dept.
- California Highway Dept.
- Connecticut Hwy. Dept.
- Texas Hwy. Dept.

CHECK ALLIED JET SEAL'S EXCLUSIVE ADVANTAGES

On airfields, highways, bridges, hydraulic projects—Allied JET SEAL offers tested proof of time, labor, and money-saving performance. JET SEAL is the outstanding concrete joint sealant.

- It has positive adhesion, cohesion, resilience and ductility at low temperatures (-20°F).
- It has no flow, even at elevated temperatures (200°F). Ideal for sealing vertical and overhead joints.
- Prevents penetration of water into joints. Unaffected by oils, solvents, highway salts, hydraulic fluids.
- Prevents incorporation of incompressible materials. Is extremely quick curing at all temperatures.

ALLIED MATERIALS CORP.

PRODUCERS, REFINERS
AND COMPOUNDERS OF
SPECIAL ASPHALT PRODUCTS

ALLIED BUILDING 5101 N. PENNSYLVANIA P. O. BOX 7278 39TH STREET STATION OKLAHOMA CITY, OKLAHOMA
PLANTS: STROUD, OKLA. DETROIT, MICH. LOS ANGELES, CALIF.



*"If I were a small contractor
I'd have one of them myself"*

EARL BOWERS • Grade Foreman
Benzie County, Michigan

After one year's experience with a John Deere "840" Diesel and elevating scraper, Michigan's Benzie County Road Commission decided to buy another, trading in a veteran crawler and pan outfit.

Grade Foreman Earl Bowers reported, "The John Deere was the best value for road work in our local sand and clay conditions. I didn't want a machine that wasn't going to load itself. We have had good service from our dealer on the first unit, and it's been cheap to operate. If I were a small contractor, I'd have one of them myself."

Combining self-loading with fast hydraulic ejection, the John Deere "840" with elevating scraper operates efficiently in conditions ranging from blow sand to heavy clays. High maneuverability speeds construction of shoulders and city streets, cuts cycle time on open highway work as well.

Your John Deere dealer will be glad to demonstrate and give you the information you need on this tractor-scraper combination. Contact him now through the classified telephone directory. Watch for big news on John Deere Wheel Tractors.

JOHN DEERE

BULLDOZERS • LOADERS • BACKHOES
AND EARTHMOVING EQUIPMENT

... for more details circle 289 on enclosed return postal card



Getting Down to Details on Job Quality Control

Project-level problems and the role of the contractor received more attention than usual at the recent Detroit convention of the highway officials. It was time this emphasis was sharpened. A Congressional committee has delved into some shoddy construction, and the new tightened inspection and testing procedures of the Bureau of Public Roads have forced the state highway departments to re-examine many of their field procedures.

Even though poor or questionable construction has been found on only a small minority of projects across the nation, it is a healthy thing for the highway program all around for the state departments to examine their quality controls afresh.

Getting roads built right calls for no mysterious formula—just common-sense principles of management, such as are practiced in any successful organization. As the Detroit speakers brought these out, they include setting up a clear chain of command, building a good staff, making sure each man knows what is expected of him, then exercising necessary double-checks to see that nobody has been slipping up.

The trouble where found isn't with the available technology, although specifications have often been poorly written. The rub has been in establishing proper communication, in double-checking, and in the human tendency of any large organization to gradually grow lax unless the boss himself

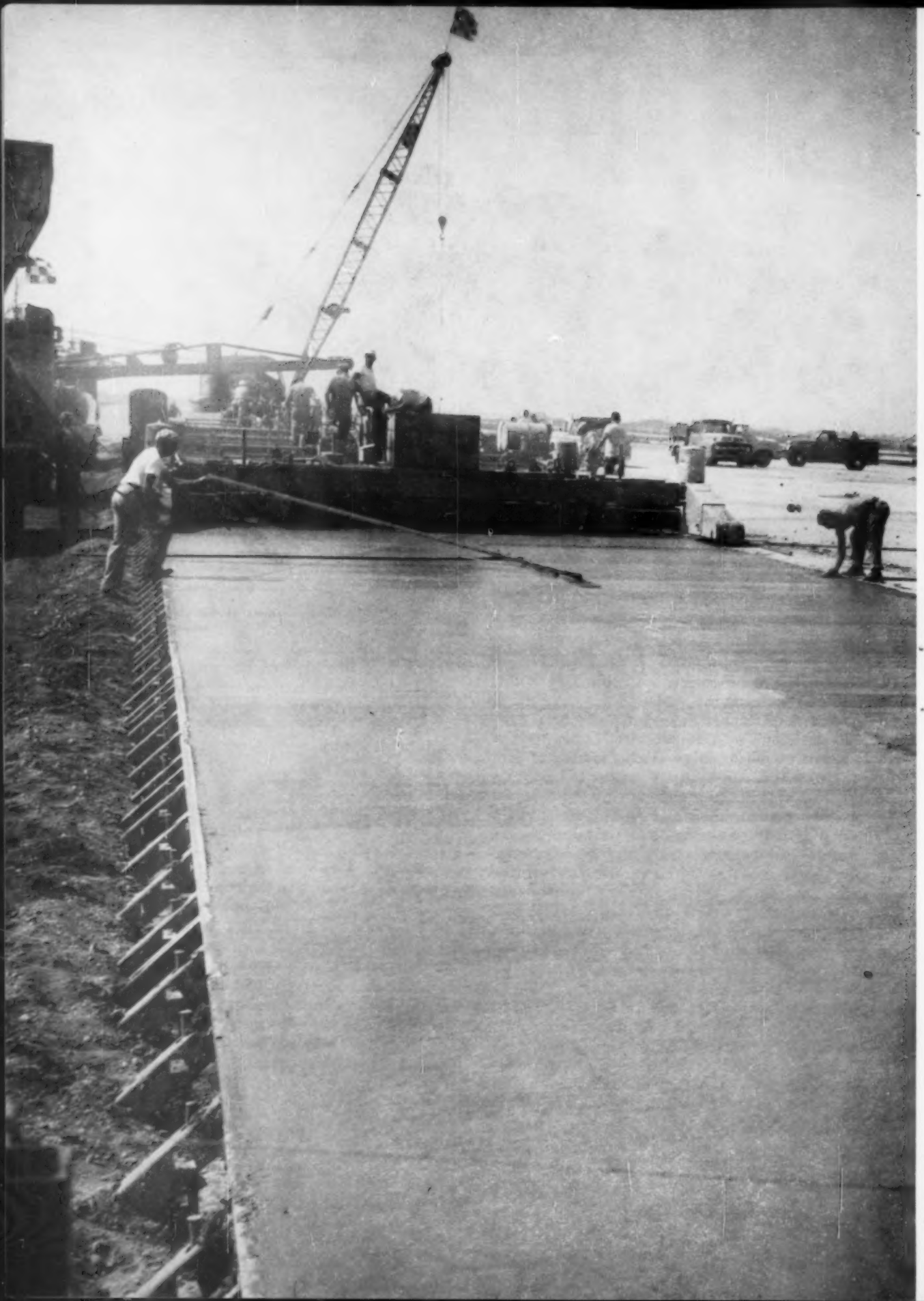
is a dynamic leader thoroughly able and desirous of running a taut ship.

Getting quality construction finally calls for good men out on projects. While the postwar engineer shortage has been eased in some respects by electronic computers and other such developments, good "dirty shoe" men—project engineers, inspectors and field testing personnel—are scarcer today than ever. It is hoped that training of such men will be stepped up.

Quality workmanship also requires the contractor's willingness. It is not good enough to have the higher-up engineers say they'll back the inspectors in controversies over the contractor's performance. The contractor himself should have a desire to do good work. Two speakers at Detroit—one himself a contractor association leader and a successful road builder—emphasized this point. Both urged that performance ability be given a higher rating in prequalifying contractors. A contractor who wants to do good work can save a lot of headaches.

Roads and Streets has had a good deal to say on quality control in the past year or two. This subject will continue to have a high place in our reporting. With new refinements looming in design, materials and construction, constructing "as specified" will require the constant best effort of everybody.

Harold J. McKeever



While the finishers are touching up at the end of a lane run, a crane in the background is set to load the advance spreader on a trailer for the over-night move-back.



Paving Train Moved Back Nightly At O'Hare Airport

Having to move all paving equipment far back to a dispersal area each night was just one of the special problems in paving O'Hare International Airport's newest jet runway. The new paving for Chicago's expanding air terminal was completed during the 1960 autumn despite a discouraging succession of handicaps.

The anticipation for the needed new facilities is aptly described by the conversation between an incoming jet pilot and the landing tower at O'Hare. One afternoon late in July, 1960, when this pilot was getting his runway designation to land, he replied: "Why not (runway) RB-47?"—and was told that it was being paved.

His response: a loud non-regulation "Hooray!"

This reaction reflected the general relief at completing a project which has been so dogged by delays. The job, the second extension to the main runway at O'Hare, was under contract to S. J. Groves & Sons Company. The bid items included a 2,762-ft. lengthening of the runway (to 11,600 ft.), and a 75-ft.-wide taxiway, also a temporary parking lot and a road and structures for the bulk fuel area. Contract price was \$4,427,292.

This work is part of the current general construction program at O'Hare costing \$103 million and designated Phase One in the full development of the field's 7,000 acres as a hub of international jet travel.

With use of the big intercontinental jets being delayed pending the extension of the runway, the City of Chicago, owner of the airport, gave this item in the contract top priority. But a wet 1959 fall and equally wet 1960 spring and summer caused great gaps in the foundation and paving schedules and carried the completion date of the runway extension well beyond its original date.

Groves placed 160,000 sq. yd. of concrete for the 15-in. x 200-ft. runway, the taxiway and holding apron. The runway was paved in eight 25-ft. lanes, one per day. Lane "5" was paved first, with the others follow-

ing from the center outward. The adjacent apron was a handy auxiliary paving site: with the newly paved lanes required to set for three days before bearing equipment, the paving train was moved to the apron, returning to the runway on the third day.

Three Koehring 34-Es laid 12 in. of concrete and after placement of the mesh the final 3 in. were laid by a Rex paver. Other major units in the train included Jaeger spreaders, Jaeger and Rex finishers, and floats.

Nightly Move-Backs

When paving the runway the contractor was required to move his equipment 1,000 ft. back from the end of the existing runway at the close of each working day to permit emergency use of the runway by jets at night. Groves used the following 'dispersal' technique:

Each lane was paved in the direction of the existing runway. During the afternoon, seven flatbed trailers were stationed in the area where the extension met the original runway. As the paving train reached the end of the lane, the first paver was moved down a nearby haul road for the designated distance. One of two waiting truck tractors, meanwhile, had hooked onto a trailer and backed into position next to a Bucyrus-Erie 22-B truck crane. The spreader was lifted aboard and driven to the overnight parking area, where the truck driver disengaged the trailer and returned to take another flatbed and await another load. The other tractor with trailer, meanwhile, had received a finisher aboard and was carrying it off. The second, third and fourth pavers were moved away under their own power while the trucks continued relaying trailer-loads of paving equipment to the overnight parking site.

With the spreaders, finishers, etc., left aboard the trailers, the above process merely was reversed at the other end of a new lane on the following morning, with the truck crane taking off the units and placing them in position for the new slab.



Groves' Butler TX4 batch plant at O'Hare. The cables leading to the two end bins (left) come from the operator's control platform, located in the open at an offside position.



A finisher float is swung into position over a trailer for the trek back to the night dispersal area.

Base and Paving Details

The 12-in. base was laid in two 6-in. lifts and compacted by a Jackson vibratory compactor to 97 percent modified Proctor density. Naess and Murphy, consulting engineers for the city at O'Hare, had as their objective a free-draining base, and the emphasis was laid on this in designating the composition of the base materials. Fines were restricted, with the gradations

permitting only zero to 5 percent passing the No. 200 sieve.

A folded seam, perforated, 6-in. steel edge drain, laid $3\frac{1}{2}$ ft. below the runway pavement edge, carries water to the main terminal drainage lines.

The routine behind the pavers included one noteworthy detail, that of joint construction. The con-

Continued on page 87

A spreader is pulled past a waiting flatbed trailer for the equipment move-back.



From an interview with D. L. Salinger
of Walter E. Heller & Company

By James R. Cummings
Associate Editor



D. L. Salinger

Shoe-String Equipment Financing Hurts Everybody

A leader in construction machinery financing offers pointed advice to contractors and distributors

What is the current reputation of contractors as risks in the purchasing of equipment?

How have equipment dealers fared in the financing of equipment purchases by contractors during this period?

Will 1961 see a change in contractor-dealer relationships in the financing of equipment?

To gain some sound answers, *Roads and Streets* went to a man who is an authority in the field of industrial finance. David L. Salinger, director of the industrial division of Walter E. Heller and Company, has a particular talent for gauging the health of the highway construction industry by taking its pulse in the financing of equipment purchases.

In its relations with the construction industry, the Heller Company supplies loans and services to manufacturers, distributors and users of construction equipment.

Regarding the coming months,

Salinger says that there is more pessimism than seems justifiable—as, a year ago, there was more optimism over the immediate future than was warranted. As one support for his confident outlook for construction in 1961, Salinger points to the larger dollar amount of bond issues which have been approved recently and which will bring more cash into the business picture. “The industry in general looks good—not uniformly so, but enough to shore up our confidence for the months ahead.”

Know Your Business

“But I’ll tell you one thing,” Salinger said, pointing his finger emphatically, “though 1961 will be a good year for those manufacturers, distributors and contractors who know their business, there is surely going to be trouble for those who don’t.”

One result of this “tightness,” he

said, will be a definite premium on experience in these three categories. Another: the distributor is going to demand a sounder cash relationship with the contractor during the coming year. There has been too much grief—and too many dealers hurt—on this score during the past year.

What are possible sources of financial trouble for contractors in 1961? Salinger mentioned two.

The first is an unrealistic attitude by many contractors on the purchasing of equipment. Too many try to wheedle the distributor into parting with expensive equipment on a slender cash basis which offers much too little support for the transaction. The “hope” that neither party will get hurt under this arrangement is very thin; such a deal may work once or twice but it is bound to fall eventually.

The second potential trouble source is this lively topic of bidding low. According to Salinger, a con-

Continued on page 72



Test roller (Bros) with 2700 x 33 Firestone ground-grip 30-ply tires; weighted to specified load of 15 tons per tire. (Pressure 100 psi.) Roller pulled by a Michigan 280 dozer.

'Air on The Run' And Test Rolling Are New On This Grading Job

By H. K. Glidden
Contributing Editor

Two aspects of the material compaction were noteworthy on the Minnesota highway project here described. Awarded late in 1958 to joint ventures Alley Construction Co., Inc., and W. Hodge-man and Sons, Inc., both of Fairmount, Minn. The \$1,956,000 job was to grade, pave, and build three bridges on a 10.7-mile segment of Minnesota Route 36 near Stillwater.

This was the first contract awarded under Minnesota's new revised specifications. In fact, the new specifications were not out at the time the job was bid; special provisions for this contract were however a forerunner to the new book issued May 1, 1959. The contractor had 140 working days on one and 190 on the other of two contracts involved, subject to liquidated damages of \$50 per day plus engineering costs. Weather was a principal factor in carrying the work over into the 1960 summer.

The first newsworthy aspect was how the contractor, working with



An air-on-the-run equipped Bros roller in action. Note air lines running to each wheel. Air pressure to the tires was piped by a swivel device from the center of each wheel.

Bros Incorporated, of Minneapolis, solved the problem of rutting of aggregate under high tire pressure equipment loads. The second was the contractor's experience with test rolling.

Nearly all contractors and engineers have experienced the difficulties of the rutting of either subgrade, base course, or surface course under the high tire pressures presently called for on pneumatic rollers. This rutting displaces the material, slows down the operations and causes trouble to all concerned in meeting evenness tolerances.

Lloyd Parker, partner in the Alley Construction Co., working with Bros' engineers, modified a Bros Roll-O-Pactor to accomplish 'air-on-the-run.' Briefly described, this model 730 pneumatic roller was equipped with an air compressor, piping, and controls whereby the tire pressure of the seven tires could be varied while the roller was in operation. Compressed air was supplied to (and from) each of the tires through swivel connections.

The center front tire proved to be difficult to modify and the pressure of this one tire was changed manually.

As explained by Archie Williamson, of Bros Incorporated, the theory behind air-on-the-run is quite simple. When the tires are inflated to 90 to 100 psi the contact area is at a minimum. At these high pressures a tire is in effect the same as a "steel band." As the pressure is reduced the tires flatten out and become more resilient.

Williamson explained that many people have tried reducing the air pressure during operation but made the mistake of reducing the roller load at the same time. Williamson points out that when you reduce the tire pressure and reduce the load correspondingly, the contact area of the tire still approximates that of a "steel band." He believes that the "rigid steel-band" effect of the rubber tires is the principal cause for the rutting action.

In operation, the "air-on-the-run"

method starts with tire pressures which will not rut the material being compacted. As the material is consolidated, the tire pressure is gradually increased to such an extent that still no rutting occurs. It was demonstrated on the Alley-Hodgeman project that by following this method the operator was able to reach the full tire pressure within a reasonably short time and secure excellent compaction results.

Roger Methven, resident engineer, stated that he was favorably impressed with "air-on-the-run" and that it was particularly adaptable to the more granular soils encountered on the project. Lloyd Parker, who acted as superintendent in the latter stages of this project, said that he felt that air-on-the-run got them through some very tough spots. He pointed out that under some conditions he reduced the tire pressure to 20 psi. Parker explained that it was easy to change the tire pressure and that the controls gave the roller operator no difficulty whatsoever.



The Alley-Hodgeman job was graded by conventional means. Seen here are two Euclid TC12 dozers pushing Cat DW20 graders in heavy material.

Bros Incorporated reportedly is receiving many requests for kits to modify existing rollers for air-on-the-run operation. Bros engineers were working on the problem of making a satisfactory air connection to the center front tire.

Test rolling, the second feature of interest, was incorporated in this contract by special provision. It was subsequently made a part of new Minnesota Specifications issued in 1959. The following are quotations from Section 2111.2.

"The roller shall be pneumatic tired, towed by suitable tractive equipment and shall conform to

the following requirements: No. of wheels—2 on 1 axle; minimum spacing between wheels (center to center)—6 ft.; Gross weight—not less than 15 tons on each wheel.

"The test rolling shall be done by making two passes over each strip covered by the width of the tire. Unrolled areas between the tire strips shall not be wider than 12 in.

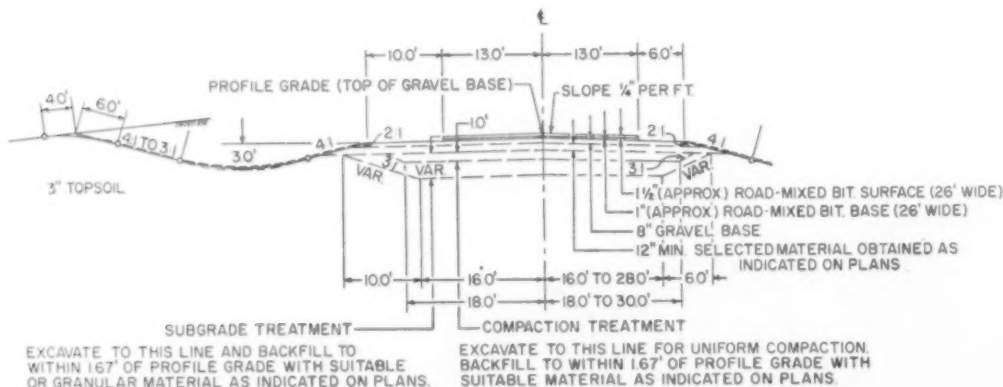
"The roller shall be operated at a speed of not less than 2.5 nor more than 5 mph, in a systematic manner so that the number of passes over all areas can be readily determined and recorded.

"The Roadbed will be considered to be unstable if, under the operation of the roller, the surface shows yielding, rutting, or upheaval of more than 2 in., measured from the top of any unheaved material to the bottom of the rut.

"If the test rolling shows the Roadbed to be unstable, the contractor shall: (1) If the underlying roadbed was constructed by him under the same contract, scarify, aerate, or add moisture as may be necessary, and re-compact the material to the extent that, when re-tested by rolling, it will be stable,

Continued on page 80

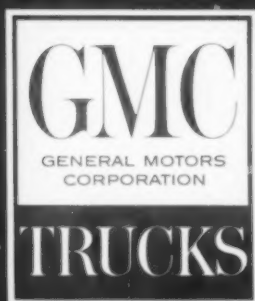
One of several cross-section variants included in the plans for the Minnesota Route 36.



NOW FROM GMC NEW, LOW-COST 6-WHEELERS!

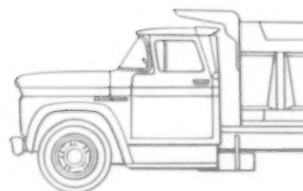
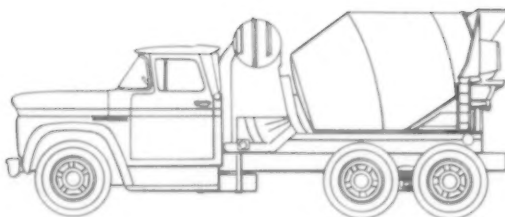


PULL HERE

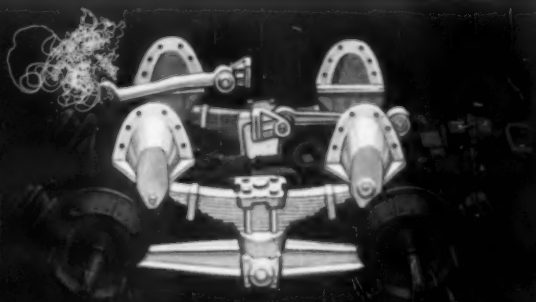


Another
TRUCK
TRIUMPH
OF THE 60's!

From ½-ton to 60-ton . . .
General Motors leads the way!
GMC Truck & Coach—a General Motors Division—
Pontiac, Michigan.



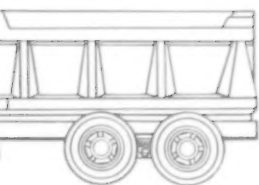
Typical examples
GMC Conventional



Lightweight, Low-Maintenance Tandems—With this GMC suspension you have less truck weight, carry bonus payloads. Equalizing beam guarantees equal load on each axle at all times. Rubber mounts and bushings at all wear points eliminate lubrication, minimize service. Short, lightweight springs only support the load . . . torque rods transmit all driving and braking forces.

**ONLY GMC EXCLUSIVELY
GIVE YOU ALL THE
LIFE-EXTENDING,
PROFIT-PRODUCING
ADVANTAGES!**

Low-Price . . . High-Performance . . . Easy-Service . . . Easy-In-And-Out Construction Trucks!—Now when you want to haul bigger loads, get added traction and flotation on your construction job—it's yours at modest cost with the new GMC 105" BBC Conventional Six-Wheelers. Exclusive, extended-life V-6 engines are standard. Wide, full-opening hood and spacious compartment make servicing simple and easy. Cab floor is low to the ground to save time and effort when getting in and out. Seeing is believing. And your GMC Dealer listed in the Yellow Pages will gladly show you all. Contact him today.



Examples of the construction uses of conventional 6-wheelers with 105" BBC.

QUICK FACTS—CONVENTIONAL 105" BBC SIX-WHEELERS		
SERIES	W5000	W5500
GVW	35,000-37,000 lbs.	43,000-48,000 lbs.
GCW	50,000 lbs.	60,000 lbs.
AXLES—FRONT	7,000-9,000 lbs.	9,000-15,000 lbs.
REAR	28,000 lbs.	34,000 lbs.
BRAKES—HYDRAULIC	953 sq. in.	—
FULL AIR	943 sq. in.	1100 sq. in.
ENGINE—V-6 GAS	351 cu. in. 180 hp. 401 cu. in. 210 hp.	401 cu. in. 210 hp. —
TRANSMISSION	5-speed direct 3-speed aux.	5-speed direct 3-speed aux.

▲ = Optional

EXCLUSIVE V-6 ENGINES

THESE

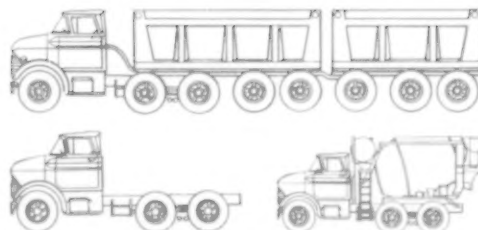
ING, PING



- Heavy-duty GMC V-6 engines are designed to give you up to 200,000 miles of continuous operation without a major overhaul, with normal use and care.
- Usable power over an extended, low rpm range for higher performance and lower fuel costs.
- Compact block has staggered cylinders and 3-inch drop skirt for more strength and rigidity.
- Up to 176 gallons of coolant circulating every minute (over twice as much as many competitive engines) provide the flow necessary for life-prolonging heat transfer.
- Cooler-running, stronger, bigger sodium-filled valves with positive rotators give you extra-long life.
- Positive valve rotators (both intake and exhaust) give valves self-cleaning action to prevent sticking, pitting, warping, leaking and burning.
- Short, stiff Tocco-hardened V-6 crankshafts weigh twice as much as those in comparable V-8s . . . are stronger . . . have unsurpassed rigidity.



Big Span for Big Savings!—GMC's complete line of Conventional Ninety-Inch six-wheelers completely match your exact hauling requirements with full-range versatility in sizes, dimensions, power, gearing and strength. Whatever you need to cut job time and reduce operating costs, you can get from GMC. Giant-size DBW9000 with 90" BBC and 120,000 lbs. GCW shown above.



Just a few popular construction uses of the GMC 90" BBC Conventional 6-wheelers.

GMC 6-WHEELERS BATTLE RISING COSTS WITH



Built To Outlast All Others!—Heavy-duty GMC cabs are built extra strong and stiff to last on tough construction hauls. You get double-panel structure; 3 big cross sills; 2 double-flanged side sills with outside channel and inner plate at cab mountings; 2 rugged braces at cab floor and back panel; heavy-duty construction everywhere.

Stronger, wider-track front axles and wide-spaced springs for greater stability and shorter turning.



More Power Per Dollar, Per Cu. In., Per Pound!

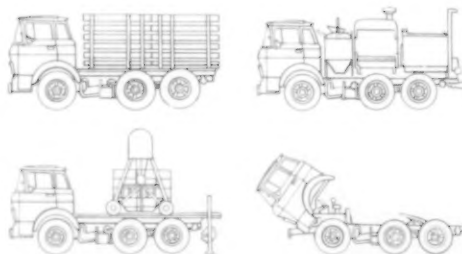
GMC V-6 Diesels—New GMC diesels are hundreds of pounds lighter, several inches shorter and less expensive to operate than other diesels in their class. Two-cycle design gives you power on every down stroke, twice as often as four-cycle design. Smoother, more responsive power permits you to get loads moving fast and keep them moving, day after day, and year after year.

Torque—577 to 604 lbs.-ft. Horsepower—189 to 218.

New-design frames can withstand the hard and grueling construction service.



Tilts at a Touch!—Tilting is an easy, one-man job with counter-balanced cab and trouble-free torsion bar spring. Engine is completely exposed. Stationary control island assures permanent positioning of controls for proper operation. Big-payload tilt-cab six-wheelers with 72" BBC and 52" set-back front axle cover the range—37,000 lbs. GVW to 76,800 lbs. GCW, LW7000 shown with exclusive Twin-Six.



Some construction applications for GMC's 72" tilt-cab 6-wheelers.

H BIG, NEW ADVANCES ACROSS-THE-BOARD!



Most "GO" You Can Get!

Exclusive GMC Twin-Six—Save job time, cut gear shifting up to 60% with the most powerful gas engine offered as standard equipment. This greatest load-moving power produced at low-stress, easy-stroking rpm also greatly extends engine life and cuts operating costs.

Profit-Performance On Every Haul

Model	Gross Torque Range	Max. Horsepower
702	625-630 @ 1400-2100	275 @ 2400

CHOOSE FROM THIS COMPLETE LINE OF GMC SIX-WHEELERS

SERIES	GVW	GCW	ENGINE
105" BBC— W5000	35,000-37,000	50,000	V-6 180 hp.
W5500	43,000-48,000	60,000	V-6 210 hp.
90" BBC— BW5000	35,000-37,000	50,000	V-6 180 hp.
BW5500	43,000-48,000	60,000	V-6 210 hp.
BW7000	45,000-52,000	65,000-76,800	V-12 275 hp.
BW9000	59,000-64,000	90,000-120,000	V-12 275 hp.
DBW7000	45,000-52,000	65,000-76,800	*V-6 218 hp.
DBW9000	59,000-64,000	90,000-120,000	*V-6 218 hp.
72" BBC— LW5000	37,000	50,000	V-6 180 hp.
LW5500	45,000-48,000	60,000	V-6 210 hp.
LW7000	45,000-52,000	65,000-76,800	V-12 275 hp.
DLW7000	45,000-52,000	65,000-76,800	*V-6 218 hp.

*Diesel—Max. Power

Easy-shifting, high-torque-capacity transmissions for the most particular buyer and most unusual application.

Bigger brakes mean surer, safer stops. Longer life, too, with increased lining areas.

Urban Factors That Boost Construction Costs

This authority discusses such items as unionization, subsurface conditions, hauling, traffic protection, material storage.

By Thomas J. Roche
Cost Engineer,
Cook County Highway Department
Chicago, Illinois

THERE are many graphs and tables of nation-wide construction costs published today in various magazines. They are very helpful for comparison purposes, but they should not be regarded as showing standard or universal costs. They are simply average costs which represent both high and low, both urban and rural construction. For use in a particular area it is well to know how much higher or lower the normal costs are in relation to these country-wide graphs. There are a number of urban or metropolitan factors to be considered.

Urban areas are usually more unionized than rural areas and labor rates are usually higher than the adjoining less organized territory. Jurisdictional lines are also more tightly drawn in urban areas. This limiting of union members to certain definite operations may affect the total productivity of the labor force if it is not adequately understood before construction starts. Jurisdictional lines may also be strictly drawn within the same trades. For instance, among electricians there may be a union that installs house wiring, another that installs street lighting and another that installs heavy motors and generators. As the danger and requisite knowledge increases, the pay rate also increases. These unions may also require that, except for common labor on cleanup, all men

on electrical work must be electricians, trained or in training.

Labor productivity depends both on geographical and on seasonal factors. When the productivity of an area is unknown, local inquiry may enable the cost engineer to determine a percentage factor to apply to his man-hour data. There is an excellent book available on productivity — *Estimating General Construction Costs*, by Louis Dallavia, which is based on General Economy, Amount of Work, Labor Productivity, Supervision, Job Conditions, Weather, Equipment and Delays.

Another factor that contributes to higher urban costs is the condition of the sub-soil. Large urban centers are usually near some body of water — an ocean, lake or river. Water action will have left its mark on the sub-soil in the form of fine sand, silt, muck and peat. Combined with underground water which is high near open water these soils are quite unstable.

Many abandoned quarries and brick clay pits, filled with refuse and garbage, may also be encountered within the urban area. Excavation in such areas may require gas masks for the entire crew. In the Chicago area, it is possible to encounter underground and sometimes in the same area, limestone, granite boulders, gravel, coarse sand, fine sand, rounded beach

sand, peat, tough brown clay, rubbery blue clay, tin cans, bedsprings, old tires and old foundations or tunnels. Even the limestone bedrock is gullied, making caisson depths a gamble. Soil tests are a must in urban areas. The test results may indicate that a costly excavation method is required but it is better to know this before construction starts.

Another factor in making urban costs higher than rural is the adjustment of existing underground utilities to fit the new construction. The ground under large urban areas is a maze of pipes — storm sewer, sanitary sewer, oil, water, gas, electricity and telephone. These utilities are usually installed, maintained and adjusted by the organization responsible for them. This setup takes direct scheduling of the work out of the hands of the contractor on the new improvement. Good scheduling of the work of the various utility crews and his own force is required on this typically urban problem.

Building demolition work is obviously more restrictive in the urban areas. While a contractor may take down a building in an open urban area in any manner he chooses, there are added requirements in urban areas where vehicular and pedestrian traffic is heavy. Canopies will be required over sidewalks and also on upper floors of

multi-storied buildings. All floors above the second may have to be removed by hand labor. Fire regulations and city ordinances make it increasingly harder to burn debris at the building site, requiring long, slow hauls for disposal of such waste.

Disposal of waste is a much more complicated problem in urban areas than in rural localities, and hence it is costlier. In heavily built-up communities, waste disposal areas are at a premium. While there may have been many old quarries and clay pits available at one time, many of these have been filled with the city's garbage or are being reserved for such use.

Haulage for any distance through heavy traffic will be expensive. The alternative is to pay premium prices for any close-in disposal areas. Owners of low lots in outlying areas may permit dumping of ordinary earth provided it is levelled. Otherwise there probably will be a dumping charge. Broken concrete is sometimes in demand for filling pits and for dry retaining walls and is less of a problem.

The converse problem of supplying fill material is equally great in urban communities, due to lack of open areas. Waste earth is rarely stored for later fill requirements because of excessive storage costs. Some contractors meet the problem by acquiring sub-soil from close-in small farms. The top-soil is stripped, a few feet of sub-soil removed and the top-soil replaced.

Other contractors have gone into the real estate business to acquire fill material. A tract of vacant property is bought outright and a deep hole is excavated in the center. When this hole is filled with water, the tract is subdivided into waterfront lots. How the contractor computes his fill costs in such a case is his own knowledge. A control estimate can be computed only on the conventional purchase of available fill and requisite haul charge.

This hauling charge will increase greatly as the center of the urban area is approached. If the basic cost of hauling in the open or rural surrounding area is known, then two or three zones of increasing haulage costs may be set up by adding a factored amount to the base cost.

These urban factors may be ob-

Classification of Factors That Affect Urban Haulage Costs

Rural

Farmland
Extensive Vacant
Road Closed to traffic

Urban 2

Built-up residential
Light Commercial
Light Industrial
Close-In or Multiple Cemeteries
Airports

Urban 1

Partly built-up residential
Outlying cemeteries

Urban 3

Heavy Commercial
Heavy Industrial
Truck or Bus Loading Areas
Multiple Institutions

tained by actually driving a car through typical zones and obtaining the driving time through vehicular and pedestrian traffic, stop signs, stop lights, railroad crossings and bottlenecks. A suggested table of haulage classification based on a land use description of the general area is shown on these pages:

The haulage type is determined from the above land use, modified by conditions such as local traffic movement and delaying factors like railroad crossings, traffic controls and streets restricting heavy vehicles, as determined by a field check. If the basic or Rural haulage is 1.0, then Urban 1 might be 1.3, Urban 2, 1.7 and Urban 3 as much as 3.5.

The haulage problem in congested areas has developed the distributor or "middle-man" system of supplying the needs of the urban area, from food to building material. These goods are distributed through the metropolitan area during off peak hours of traffic, so that they are available in all sections of the area when needed. Of course this rehandling adds to the cost of the goods, but this added cost is still probably less than the cost of a long haul through heavy traffic from the prime supplier.

The contractor in a rural area might possibly haul his material direct from a producer at twice the distance he could haul it in an urban area in the same time. There may also be no gain in circumventing the distributor by going direct to the producer, because the lost time of a truck and driver waiting his turn at the loading dock may be greater than the added distributor's cost.

The traffic load in urban areas is such that it is very difficult nowadays to detain traffic. Usually traffic is maintained on half the roadway. At new grade separations

a run-around slab of expendable pavement is sometimes provided while construction is under way. While such measures help to maintain the normal traffic flow, they do not help the rate of production. Labor costs might be adjusted, on a factor basis, that is — 1.0 for Rural, perhaps 1.1 for Urban 1, 1.2 for Urban 2, 1.3 for Urban 3. A workman who is trying to "look alive to stay alive" in heavy traffic will understandably have only part of his mind on the job.

The large number of adequate barricades, lights and warning signs required is another added urban expense. There is also the matter of cleanup. Haulage of earth through neighboring residential street leaves droppings which must be cleaned up and also sprayed in dry weather. Much dust from the construction operation is sure to bring requests for relief from neighboring home owners. These complaints may also prohibit the use of night hours for meeting a deadline.

Another added urban cost is due to the difficulty of storing materials until used and equipment that is not in use. It is unusual to find available space near the job site in built-up areas and where traffic must be maintained. The time lost in transporting such equipment and material the extra distance is another added cost.

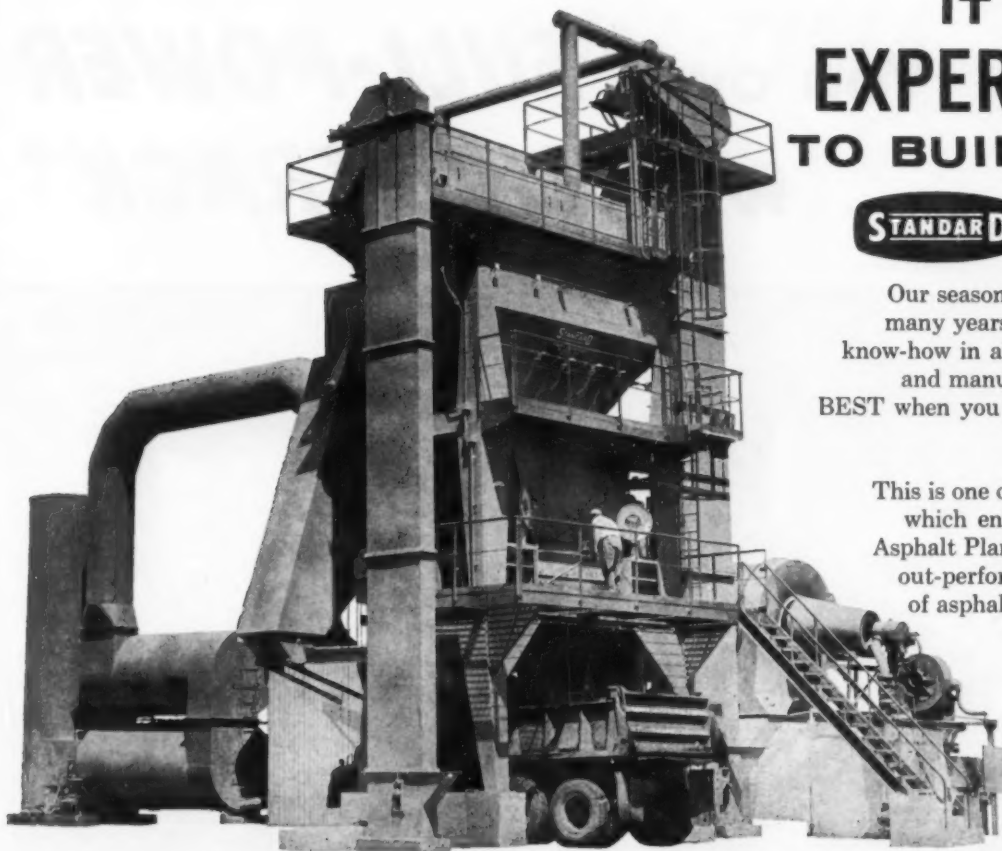
Anyone who has knowledge of rural construction costs may quickly obtain the markup factor for urban construction costs by comparing his normal living costs — food, clothing and shelter, with corresponding urban costs. If he then averages these urban construction costs with his known rural construction costs he will probably find these average costs agree with the nation-wide graphs and tables.

IT TAKES EXPERIENCE TO BUILD THE

STANDARD ASPHALT PLANT

Our seasoned craftsmen with many years of experience and know-how in all phases of design and manufacture assure the **BEST** when you buy **STANDARD** Asphalt Plants.

This is one of the many factors which enable **STANDARD** Asphalt Plants, size for size, to out-perform all other makes of asphalt plants, i.e.: more production at less operating and maintenance costs.



33 YEARS WITH STANDARD

STEVE POPP, maintains proud record in building and assembling **STANDARD DRYERS**.



21 YEARS WITH STANDARD

GILBERT TORRES, expert on precision fitting, carefully adjusts mixer bearing.



18 YEARS WITH STANDARD

BOB PEREZ, veteran employee on **STANDARD** Asphalt Plants — specializes in assembly of mixing units.



14 YEARS WITH STANDARD

NEIL MULVIHILL, shop foreman personally supervises the building of every **STANDARD** Asphalt Plant.



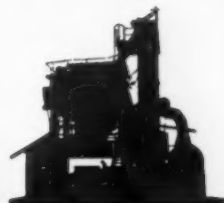
STANDARD / Complete line of Asphalt Plants
2000 through 8000 pound capacity.



Model T-M • Trailer-mounted, self-contained.



Model R-M • Semi-portable and stationary

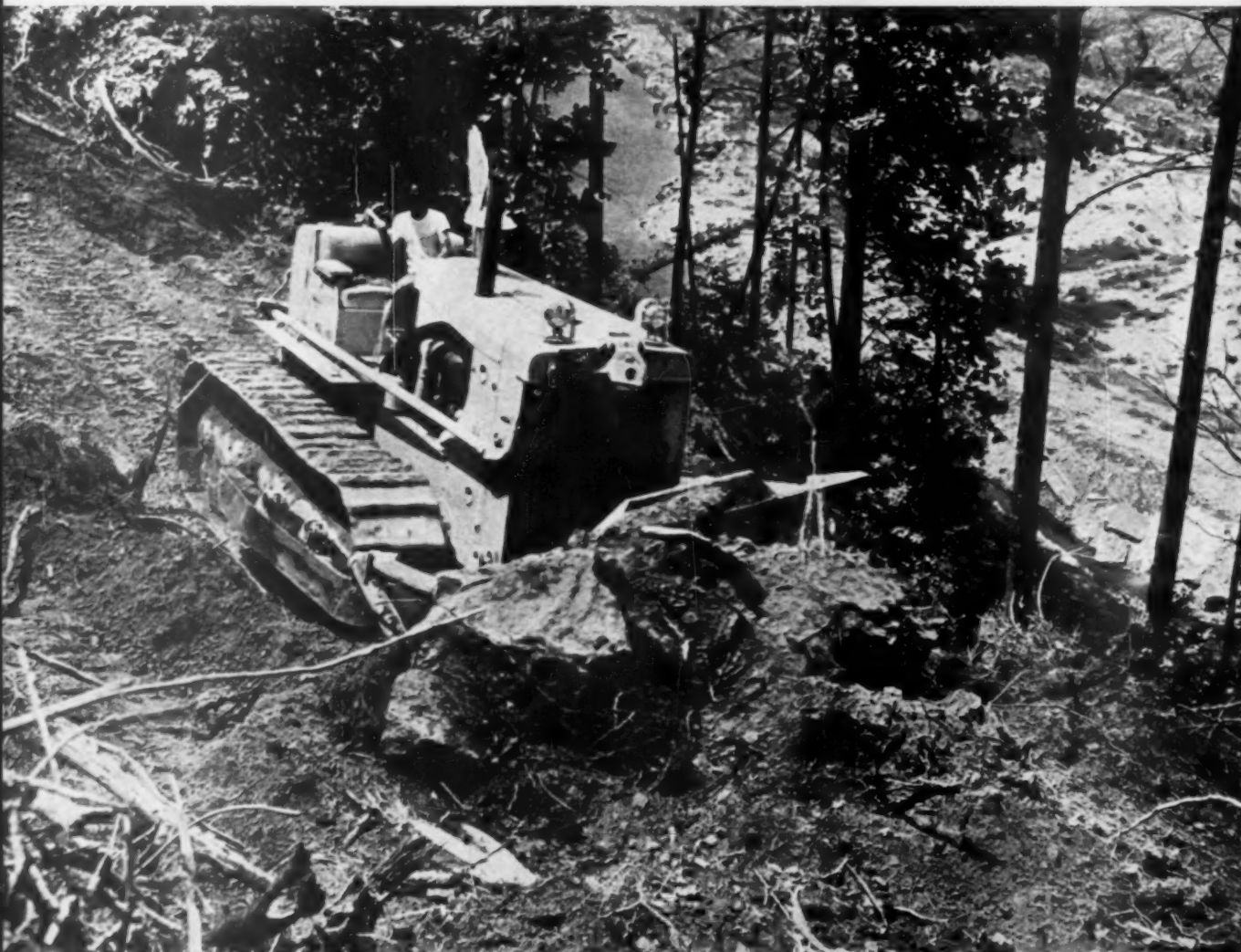


Model S-E • Self-erecting, fully portable.

STANDARD STEEL CORPORATION Manufacturers of: Asphalt Plants • Rotary Dryers • Kilns • Coolers • Cryogenics
GEN. OFFICES AND PLANT: 5003 BOYLE AVE., LOS ANGELES 58, CALIF. • MIDWEST OFFICES AND PLANT: DECATUR 03, ILL. • EASTERN OFFICES AND PLANT: LOWELL 03, MASS

... for more details circle 324 on enclosed return postal card

You own **FULL-POWER**
... with **"LIVE-TRACK"**



"Live-track" Planet Power-steering eliminates load-limiting "dead-track drag!" The TD-25 pushes or pulls the same king-size loads on turn or straightaway! On-the-go Hi-Lo power-shifting ends "gear-shift lag!" The "25" gives you instant, up-or-down matching of power to condition. *You turn with the dozer fully loaded, without spillage — do constant contact push-loading applying full power, getting full speed, without mauling the scraper!*

Only the "25" gives you the wallop of the International DT-817 engine — 230 turbocharged Diesel hp —

to eliminate "slow-motion" lug-downs, even at high altitudes. For full performance under slam-bang conditions, the "25" has the super undercarriage strength of double-box-beam, precision-welded track frames!

No wonder owner after owner reports that 230-hp "25's" outwork king-sized clutch-steered crawlers, up to 50%! Prove to yourself what it means to own the capacity-boosting advantages of full-power momentum — full time, as *standard equipment!* Let your International Construction Equipment Distributor demonstrate the TD-25!

momentum **FULL-TIME**

TD-25 performance!

◀ **Beat the benching capacity** of clutch-steered crawlers 100-hp bigger! Simply shift the TD-25's bank-side track to high range—the outside track to low—for full-bite benching. No "bank-nosing"—no sluing—no "lever-fighting." The planet-drive "25" keeps itself "on course"!

This TD-25 removes over 60% more overburden for a quarry man than his formerly-owned king-size clutch-steered crawler. Reasons: full-time "live-track" Planet Power-steering ends load-spilling "dead-track drag"—and the TD-25's high reverse of 7.5 mph cuts his dozer cycle time by more than 10%! ▶



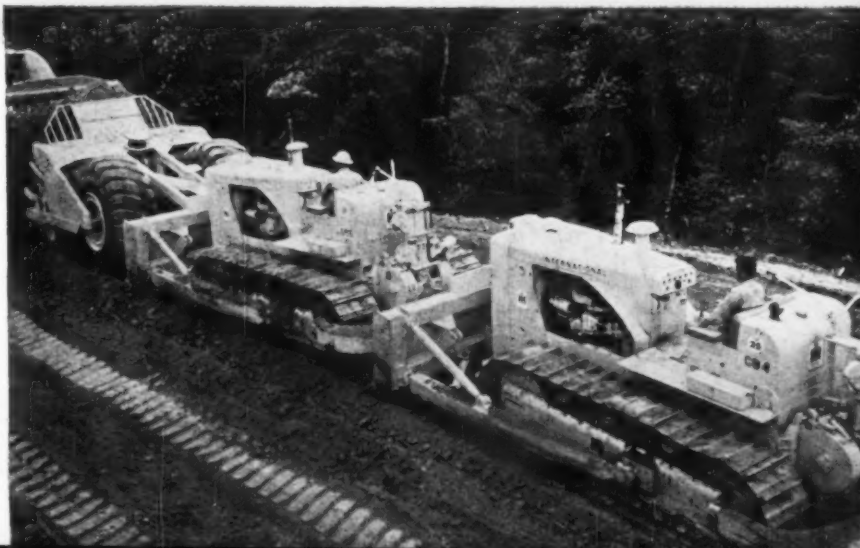
◀ **With on-the-go Hi-Lo power-shifting**, you shift down to dig hard materials—shift up to "run" with the load. Hi-Lo power-shifting makes the TD-25 the industry's only 4-speed torque-converter crawler, and the only one with load-matching efficiency-range control. Only simplified TD-25 planetary design is engineered and located to give you "live-track" power-steering and on-the-go power-shifting!



***International
Construction
Equipment***

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

You speed up all four steps of the push-loading cycle with the torque-converter TD-25. (1) You power-shift down and use decelerator to get feather-touch contact; (2) power-shift either track up or down to keep solid push-block contact on curves; (3) power-shift up, on-the-go, for gear-higher kick-outs; (4) with 7.5 mph reverse, reposition faster than other rigs! ▶



... for more details circle 304 on enclosed return postal card



Instructor showing trainee how to work grader controls.



Tip to Contractors:

Army Turning Out Trained Operators

Of more than passing interest to many a contractor is the U. S. Army's training program for construction equipment men. These men, after a hitch in the service, are capable of making excellent crewmen for civilian contractors.

Here is a source of supply that should not be overlooked in these booming times when the need for competent, highly skilled heavy equipment men continues to grow. Construction people could well look into the possibility of these military graduates as good recruit material for their own use.

The Army trains soldiers to operate earthmoving and other heavy equipment at its Fort Leonard Wood, Mo. installation. The Army's 4th Training Regiment at Fort Leonard Wood is the world's largest construction equipment operators' school. Here, men are being trained daily and upon discharge are poten-



No, this isn't an actual public road job. In progress here is an operator class on graders with trainees in the driver's seat and instructors alongside.

tial sources of skilled operators and maintenance service men for a wide variety of construction equipment.

The school is located on 640 acres southwest of the main base. After 16 hours at the wheel, the student operators are far enough along to grade a dirt road actually used in training light vehicle drivers. There is more than \$2,500,000 worth of heavy construction equipment available at the school for instruction purposes.

The objective of the Army's training program in the Construction Machine Operator Course at Fort Leonard Wood is to teach trainees to operate motorized graders, crawler type tractors, towed scrapers, rooters, rollers, air compressors, and pneumatic tools. Of equal importance is the training the students receive in performing maintenance on the same equipment.

The six weeks of the course are

divided into three phases. During each period the students spend the first week concentrating primarily on world definitions and what the equipment is for. The second week is spent in practical exercises, working with the machines and seeing that they are properly kept up before, during, and after operation. In other words, the second week of each phase sees the students in actual production. In general, the practical exercise includes basic bulldozing, angledozing, constructing cuts and fills, side hill cuts, removal of trees, stumps and boulders. In addition, the trainees must demonstrate the construction of cuts and fills with scrapers, downhill loading, and handling of large stumps and boulders. They are engaged in practicing rough and finish grading, maintaining roads, and ditching with motor graders.

The student also gets time to learn something about sheepfoot

and other rolling, slope and grade stakes, principles of internal combustion engines, and electrical, cooling and lubrication systems.

Approximately 30 to 35 hours are spent in the actual operation of each of the three machines, dozer, grader and scraper. About 45 men graduated each week for a total of well over 2,000 annually. There are 37 active instructors and 14 office and administrative people assigned to the school.

At the present time, the following equipment is being used at Fort Leonard Wood:

24 International TD-18 tractors with angle blades.

25 Caterpillar D8 tractors with angle or bulldozer blades.

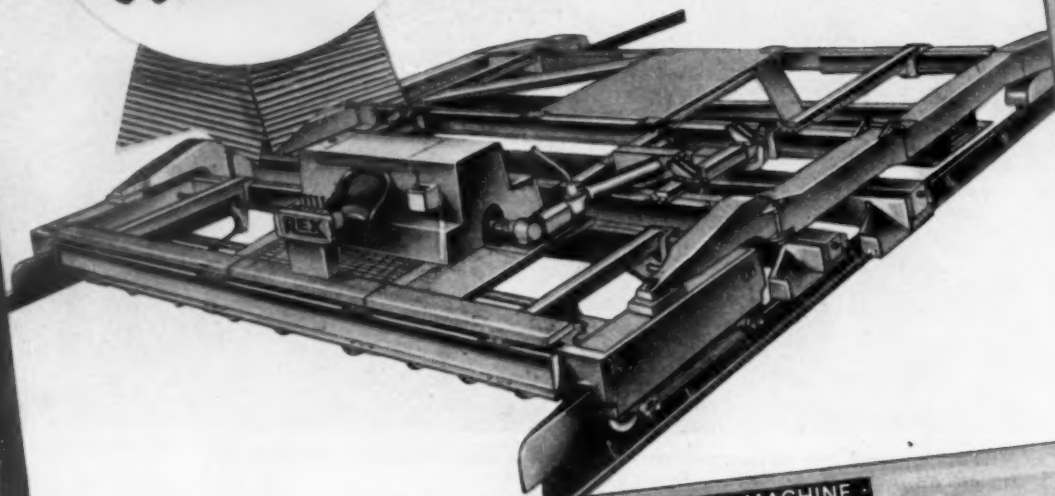
19 International TD-18s for towing scrapers.

22 Caterpillar D8s without blades.

21 12-yd. scrapers, three Wool-

Continued on page 54

NEW
**Profit
Winners**



NEW REX SPREADER-FINISHER-FLOAT MACHINE

Now, for the first time on forms—the complete paving operation performed by a *single* machine in a *single* pass with a *single* operator.

Rex Slip-Form Paver—The remarkable performing machine that needs no road forms—while single-handedly combining the complete concrete spreading and finishing operations at a continuous, rapid rate. Ask about it!

REX.

concrete road paving's
most profitable
line-up



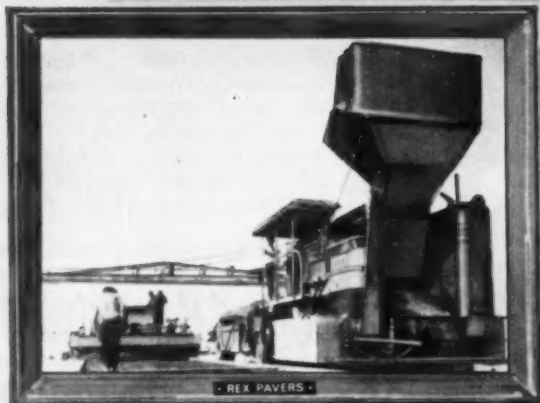
REX SLIP-FORM PAVER



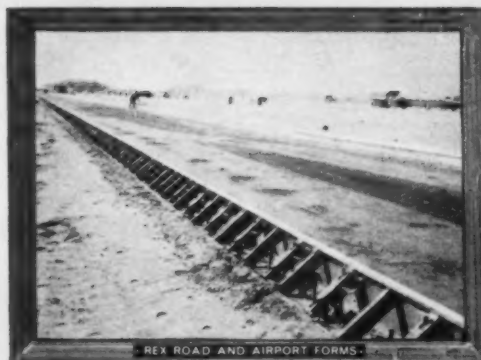
• REX COMBINATION FINISHER-FLOAT •



• REX SELF-WIDENING SPREADER •



• REX PAVERS •



• REX ROAD AND AIRPORT FORMS •



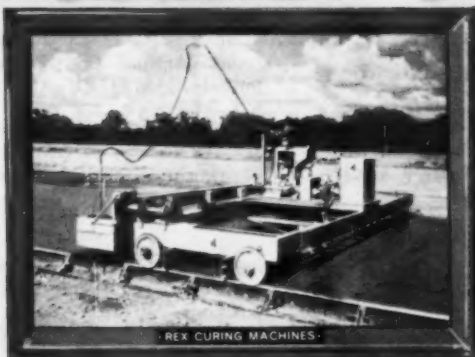
• REX MANUAL WIDENING SPREADER •



• REX LONGITUDINAL FLOAT FINISHERS •



• REX FINISHERS •



• REX CURING MACHINES •



• REX CENTRAL-MIX PLANTS •

*Also Rex
Subgrade
Planers and
Testers*

Assure yourself bid-winning and profit-building advantages—re-equip now with Rex! Talk to your Rex distributor now or write for catalogs. CHAIN Belt Company, 4642 W. Greenfield Ave., Milwaukee 1, Wis. In Canada: REX CHAINBELT (Canada) Ltd., 1181 Sheppard Ave. East, Toronto. Distributors in all principal cities of the world.

REX[®]
CONSTRUCTION MACHINERY



Placing dirt in the proper place is just as important as picking it up for Army students in heavy construction equipment.



Student operator at the controls learning some of the tricks of dozing.

ARMY OPERATORS

Continued from page 51
dredge Model os122A, the remainder LeTourneau Model LP.

8 8-yd. scrapers, LeTourneau Model LS.

20 Caterpillar Model 12, 8-T series graders.

20 Austin-Western Model 99-H.

3 LeRoi air compressors, trailer mounted 315-CFM.

2 Minneapolis-Moline rubber tired tractors.

2 Jacques skid-mounted earth augers.

4 Towed rippers, LeTourneau-Westinghouse Model H-s or K-30.

1 LeTourneau M-20 towed crane.

2 Steel-wheel rollers, a Buffalo Springfield and a Galion Chief 10-ton.

3 Bros pneumatic-tired 13-wheel rollers.

3 Two-drum sheepsfoot rollers; LeTourneau-Westinghouse Model W-2, Standard Steel, Grace Model RSX-112.

Do the students make good civilian employees? After their discharge, are they able to jump into civil employment?

According to Sgt. James C. Stone, noncommissioned officer in charge, most course graduates who gain further equipment experience while in the service become exceptionally well qualified for civilian employment. Sgt. Stone reports that a great many are currently working in civilian construction, and that others will follow as a career.

Meetings

HIGHWAY RESEARCH BOARD—40th Annual Meeting, Sheraton Park Hotel, Washington, D.C.; January 9-13, 1961.

NATIONAL CRUSHED STONE ASSOCIATION—Annual Convention, Americana Hotel, Miami Beach, Fla.; January 17-20, 1961.

NATIONAL LIMESTONE INSTITUTE—16th Annual Convention, Statler-Hilton Hotel, Washington, D.C.; January 17-19.

13TH CALIFORNIA STREET AND HIGHWAY CONFERENCE—Presented annually by the Institute of Transportation and Traffic Engineering, and University Extension, University of California, held on University's Campus, Berkeley, Calif.; January 26-28, 1961.

NATIONAL BITUMINOUS CONCRETE ASSOCIATION—5th Annual Convention, Shamrock Hotel, Houston, Texas; January 28-February 1.

ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS—1961 Meeting, Hotel Francis Marion, Charleston, S.C.; February 6-8.

ASSOCIATED EQUIPMENT DISTRIBUTORS—Annual Convention, Statler Hotel, Los Angeles, Calif.; February 6-9.

AMERICAN CONCRETE INSTITUTE—57th Annual Convention, Chase-Park Plaza Hotels, St. Louis, Mo.; February 20-23.

ASSOCIATED GENERAL CONTRACTORS OF AMERICA—Annual Convention, Hotel Statler, Boston, Mass.; February 26-March 2.

AMERICAN ROAD BUILDERS ASSOCIATION—59th Annual Convention, Chalfonte-Haddon Hall, Atlantic City, N.J., March 5-8.

AMERICAN SOCIETY OF CIVIL ENGINEERS—Spring Convention, Hotel Westward Ho, Phoenix, Arizona; April 10-14.

AMERICAN WELDING SOCIETY—42nd Annual Convention and Welding Exposition, Sheraton-Atlantic Hotel, New York, N.Y.; April 10-15.

WESTERN ASSOCIATION OF STATE HIGHWAY OFFICIALS—40th Annual Conference, Flamingo Hotel, Las Vegas, Nevada; April 23-28.

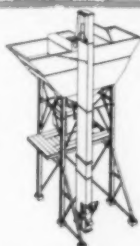
CONFERENCE ON PARKING—Georgia Institute of Technology, School of Civil Engineering, Atlanta, Ga.; May 18-19.



Charge, Batch, Open the Gates on Profit with a Johnson Plant

Here are three transit-mix plants that cost little and offer a lot: easy erection, simple precision mix control; and years of service with a minimum of attention.

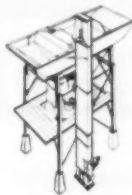
JUMBO



102-cu-yd of aggregate storage in 3-compartment bin.
155-185-bbl overhead bulk cement tank.
6-cu-yd Hi-Speed Concentric Batcher with independent cement scale and hopper.
315-380-bbl-per-hr cement elevator.

The Jumbo is the largest of the low cost transit-mix plants. It offers controlled discharge of aggregate and cement through two separate levers. Cement is discharged within the aggregates to increase pre-mixing and minimize dusting. Packaged design makes erection and servicing easy. Pneumatic cement charging system available for handling bulk cement.

ECONO PLANT



45-cu-yd in 3 aggregate compartments. 55-70-bbl cement compartment.
200-240-bbl-per-hr cement elevator.
3-cu-yd concentric batcher with independent scale for cement weighing.
Charging height 30½ feet.

Econoplant easily meets toughest specifications at high speed. Low charging height makes it ideal for clamshell charging. Cement is discharged within aggregates. Cement compartment comes complete with low-pressure aeration system.

ROUST ABOUT



38-cu-yd aggregate in 3 compartments. 50-bbl cement compartment.
200-240-bbl-per-hr cement elevator.
3-cu-yd concentric batcher with independent scale for weighing cement.

Roustabout is designed for quick assembly and convenient trucking between jobs. Maximum width of largest section is 9 feet. Maximum erection lift is only 4½ tons. Entire plant can be up and working in less than a day.

2100



Johnson makes a variety of clamshell and concrete buckets, including special Lo-Slump buckets operated manually or by air. See your Johnson distributor for details.

C. S. JOHNSON CO.
Champaign, Ill. • Stockton, Calif.

KOEHRING
A Division of
Company



ALLIS-CHALMERS

SWITCH TO KON-TORK DIFFERENTIAL.

KON-TORK differential provides every Allis-Chalmers motor scraper with maximum traction to match any working condition—provides you with all-weather production.

Only Allis-Chalmers offers exclusive KON-TORK differential in every motor scraper. This traction-

boosting benefit makes dirt pay under severe job conditions.

KON-TORK works automatically, whenever it's needed. In the cut, on the haul or soft fill, it helps you by automatically controlling the transfer of torque to each drive wheel . . . giving you the benefit of all available traction *all the time*.

Example: When one drive wheel hits soft going, KON-TORK takes hold and transfers torque from the slipping wheel to the wheel with solid footing to keep the machine moving out. Another nice thing

move ahead with

ALLIS-CHALMERS

TS 360



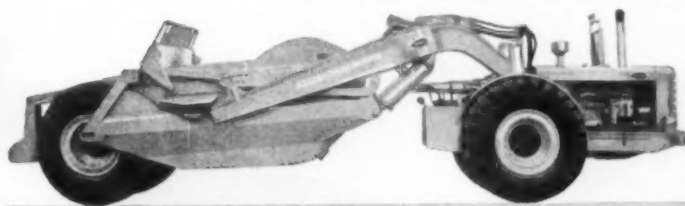
TRACTION MAGIC, EVEN IN MUD

about KON-TORK . . . it's simple! Only five working parts . . . never needs adjustment!

But this is only one of many features that keep Allis-Chalmers motor scrapers out front on every job. You should see what *full-power steering—double-acting bowl jacks—hydraulic forced ejection and highest apron lift* can do for your production. Try any one of 3 models from 10 to 30 yards. See for yourself. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

KON-TORK is an Allis-Chalmers trademark.

*Now available in Persian Orange
or Allis-Chalmers Yellow at no extra cost.*



ALLIS-CHALMERS



...power for a growing world

... for more details circle 278 on enclosed return postal card

HERE'S stability you can really bank on. The new AMPAC 4 Compactor is entirely different from anything else there is. Entirely different and far better. You will quickly spot this difference when you see the kind of compaction it gets—and how fast! The AMPAC 4 has 16 wheels (8 and 8) with 4¾-in. overlap front to back. You can use a loader to ballast through 8-ft-wide, top-opening doors. And here's a good point: Those wide-opening doors are also tight-closing doors, so you can maintain the weight you choose—rain or shine. The AMPAC 4 has its own sprinkler system, with a separate 360-gal tank and pump.

The operator will like the difference, too. He really sees his work from where he sits, and it sure beats that long climb "top-side." And it handles easily—forward or backward. The front axle swings a full 90° for easy U turns on any standard roadway. It won't scuff, either. The torque-proportioned drive provides a differential action that's smooth as oil. Let us send you our fully illustrated brochure. Just write American-Marietta Company, Construction Equipment Division, Milwaukee 1, Wis.



AMERICAN-MARIETTA

... for more details circle 277 on enclosed return postal card

Start Made, But Huge Road Needs Lie Ahead Tallamy Tells AASHO Delegates

There was a lull-before-the-storm atmosphere at the highway officials' convention last month in Detroit. Delegates there for their 42nd annual meeting of the American Association of State Highway Officials were mindful that—in a few short weeks—Congress would again convene. 1961 will be a fateful year for the much-maligned federal highway program, now up for further financing.

A chief concern is over the need to put the program on a sounder long-range footing.

Against this backdrop of concern Federal Highway Administrator B. D. Tallamy reminded the delegates of the national growth that lies ahead, calling for vast new highway traffic capacity. And he reviewed with pride the substantial progress made in the first 41½ years under the expanded (and then retarded) highway effort.

Since the 1956 Federal-aid highway act set up the present Interstate program, said Tallamy, motor vehicle registration has grown from 65 million to 74 million. And by 1976, we'll have 114 million vehicles with 154 million drivers generating 1.2 trillion vehicles-miles of travel annually—about double the present flow. A continuing high level of road construction obviously is one of the top-priority needs on the U.S. domestic scene if the country is to grow and remain strong.

Having spotlighted this need, Tallamy turned to the accomplishments of the road builders in 41½ years. Some of the figures:

1. More than 10,000 miles of the 41,000-mile Interstate system are open—4,200 miles to standards for 1975 traffic, 3,000 to standards sufficient for now. (Figures take in some toll roads.)

2. Interstate projects under construction (Sept. 30, 1960) totaled 4,500 miles, preliminary engineering and right-of-way work in progress on 10,000 miles, location well along for another 11,500 miles.

3. Over 106,000 miles of ABC system construction contracts completed—an unprecedented accomplishment in itself. Another 24,000 miles of ABC projects are under way, with a large store of plans ready for bids.

4. Money-wise, the Interstate effort in 41½ years has totaled over \$9 billion put into work. Another \$5.2 billion of jobs is under way or authorized.

5. Interstate right-of-way acquisition is completed for 7,850 rural miles and 1,290 urban miles, costing \$1.5 billion.

6. Over \$6.5 billion in ABC system funds has gone into completed jobs; another \$2.7 billion in progress.

Administrator Tallamy named some of the special engineering developments and accomplishments since 1956. Some of these:

1. The engineering manpower shortage has been greatly alleviated through adoption of modern methods and equipment. Electronic computer use has been expanded into every phase of highway work. The Bureau's Library now num-

bers 400 programs. Radiotelephone communication also has expedited project management in some states.

2. Highway research has been stepped up. The Bureau conducted or sponsored 578 projects completed since 1956, and 178 more are active. The state departments have 200 others financed by the 1½ percent of federal-aid funds available for this use. Biggest project is the AASHO Test Road near Ottawa, Illinois, a \$37 million investment, with industry sharing.

3. The Highway Cost Allocation Study is being wound up after 4½ years. Conducted by the BPR with the states and the AASHO Test Road Project cooperating, it will give Congressional leaders new data on vehicle use in relation to road design and cost, as a basis for tax planning for highway financing.

4. The report "The Federal Role in Highway Safety" is a major accomplishment.

5. The status of city planning in relation to urban highways has been studied on a nationwide basis. Data vital to intelligent urban route planning have covered 411 centers of 25,000 population or over—again using the 1½ percent funds.

Other major achievements on Tallamy's list included the BPR's administration of forest and national park road work (4,880 miles constructed since 1956); foreign highway technical aid (Central America, Laos, Lebanon, Iran, Yeman, other countries); civil defense emergency planning; codification of highway laws.



Rex M. Whitton, Chief Engineer, Missouri State Highway Department, (right), being presented the Thomas H. McDonald Memorial Award at the AASHO meeting. Presented here by Executive Secretary, A. E. Johnson. The award is given annually by the Association for "outstanding meritorious service" to the highway program.

1961 and Beyond

Looking ahead, Mr. Tallamy noted that expenditures of federal funds for Interstate projects for the present fiscal year (ending June 30, 1961) will be just under \$3 billion, compared with \$2.9 billion the previous fiscal year. Under the present reimbursement planning procedure, about \$3 billion is available for obligation during the current fiscal year. About \$2.3 billion has already been released. The remaining \$0.7 billion will become available about April 1, 1961.

Most states have advanced their Interstate projects on a straight-line basis, said Tallamy, doing this rather than taking advantage of the early availability of funds provided for in the 2nd and 3rd quarter allowances recently released under the reimbursement planning

schedule. The outlook now is for future reimbursable obligation schedules of about \$3.2 and \$3.3 billion for fiscal 1962 and 1963, after which the rate would drop back to about \$2.5 billion annually for the Interstate and ABC programs combined. Interstate apportionments would drop to \$1.5 billion for fiscal 1964, rising slowly thereafter. However, said the Administrator, "it is hoped that Congress will take action which will enable a continuation of the program at a high rate, designed for completion of the Interstate System in 1972 as originally planned." Authorizations of about \$3.2 billion annually are necessary starting with fiscal 1963 if that objective is to be met. This will require extending the Highway Trust Fund.

Administrator Tallamy in clos-

ing dwelt on the economic impact of the road program—how the new national system of highways is reworking the face of the country, bringing or accelerating great new community changes.

It has happened in stream pollution. It is threatened in education. It could happen in highways to bring greater centralization of authority. The present effort of the Bureau of Public Roads to answer Congressional criticism by "tightening up" administrative aspects of the road program gives a hint.

This federal step-up has been spurred by the coming to light of improper handling of public funds in a few states, improper relationships between engineers and contractors, and poor workmanship in some cases. In any grant-in-aid federal program, noted Stevens, improper procedures will usually stimulate the federal government to act as a policeman. This means that more reports are required of the lower government level, and more instructional material is issued. This is a futile effort as a rule, he said, since dishonesty if it exists thrives on red tape.

President Stevens in closing expressed the hope that Congress in the coming session will provide opportunity, through hearings, for an overall evaluation of this and related administrative problems. Any modification of the historic federal-state relationship, Stevens said, should give recognition of the great body of competent and experienced leaders in the state highway departments. In almost any state department the top ten men will represent between 250 and 400 years of experience in highway construction and maintenance.

What of Future State and Federal Role?

In his address as retiring president of AASHO, David H. Stevens of Maine asked "how and by what agency will the highway program be carried out?"

In asking this he reflected the concern of many highway officials over the long-range outlook as to the federal-state relationship. Historically the present unique cooperative setup has given the nation its highway progress. Today as in the past the principal has been

preserved that federal-aid be administered through the instrument of a strong state highway department. A minimum of controls and duplicative effort by the federal government has characterized the setup.

Now with the federal share grown to 90 percent for Interstate funds, and with much larger sums involved, there is possibility of an increasing domination of highway

affairs by the federal government. Stevens urged that the governments of the respective states maintain a strong and effective highway administration. "Nature abhors a vacuum," said Stevens, adding that when the vacuum exists in the form of a state which tends to abdicate its highway responsibility to Washington, then local minority groups will inevitably turn to the federal government to secure action.

"ReoMatics save 6½¢ per mile for Arizona Sand & Rock," reports Ralph Greer, Equipment Superintendent.



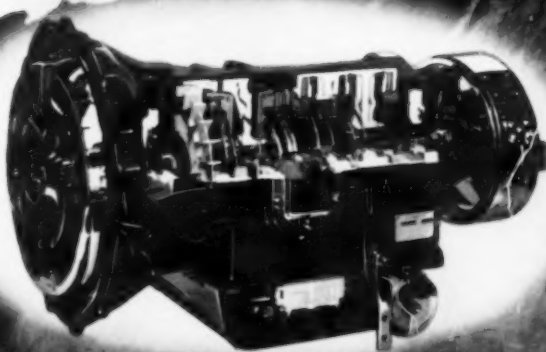
On a fleet-wide basis with each unit averaging 20,000 miles per year, Arizona Sand & Rock pares its operating costs by 6½¢ per mile through the use of automatics over straight sticks. ASR's Reo dumps and mixers are equipped with Reo Gold Comet Engines and ReoMatic transmissions. Prime reason for ASR's standardization on automatics is to relieve costly shock load damage to drive lines and speed up delivery service to customers.

REO DIVISION, The White Motor Company, Lansing, Michigan.



Gold Standard of Values

REO



REO LIFETIME POWER

Every Engine in the Line Wet Sleeve Constructed

The engine is the heart of the truck, and no truck can be better than its engine. Horsepower, type of fuel, ease and cost of maintenance, performing ability and suitability are important factors to every trucker's profits.

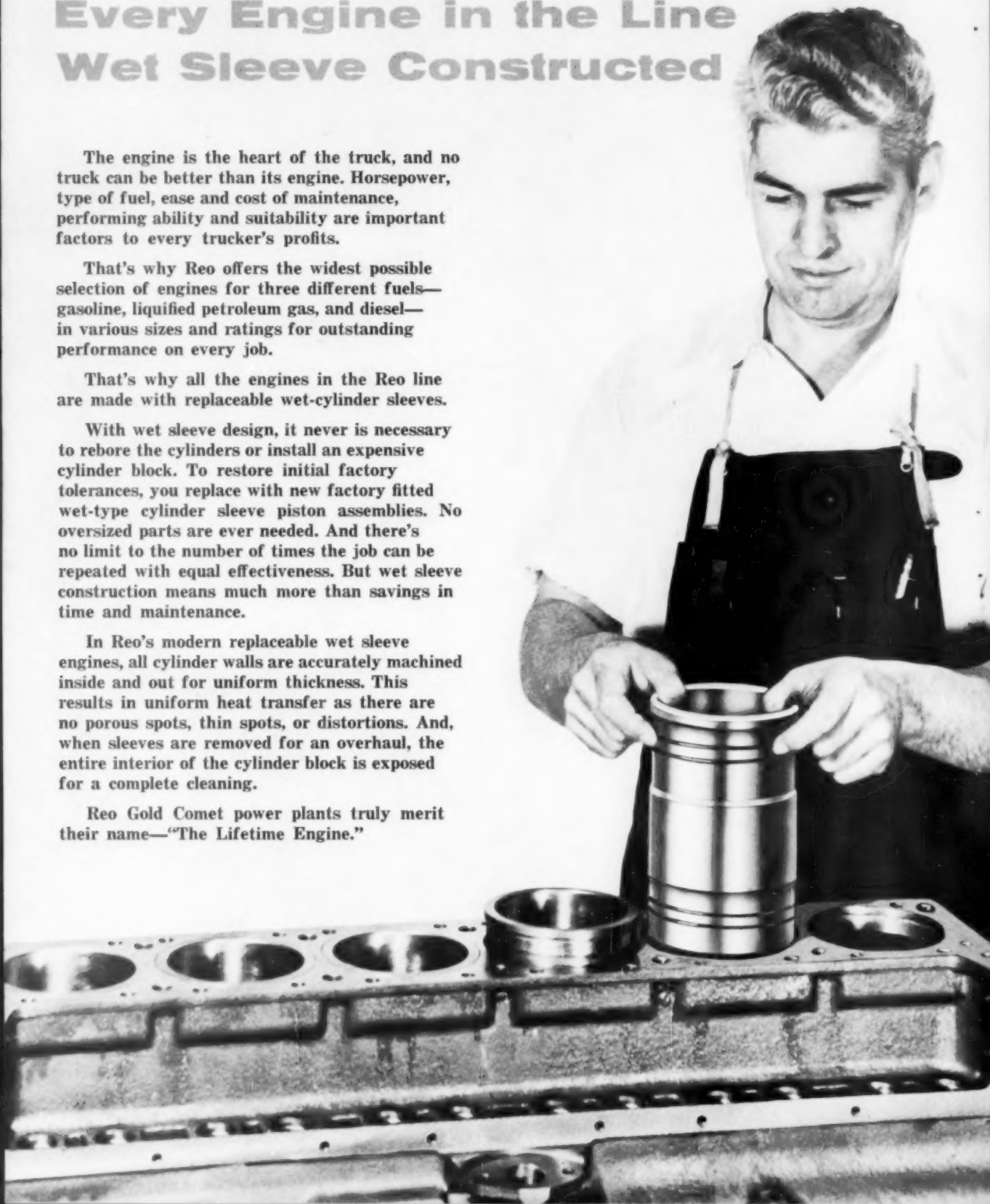
That's why Reo offers the widest possible selection of engines for three different fuels—gasoline, liquified petroleum gas, and diesel—in various sizes and ratings for outstanding performance on every job.

That's why all the engines in the Reo line are made with replaceable wet-cylinder sleeves.

With wet sleeve design, it never is necessary to rebore the cylinders or install an expensive cylinder block. To restore initial factory tolerances, you replace with new factory fitted wet-type cylinder sleeve piston assemblies. No oversized parts are ever needed. And there's no limit to the number of times the job can be repeated with equal effectiveness. But wet sleeve construction means much more than savings in time and maintenance.

In Reo's modern replaceable wet sleeve engines, all cylinder walls are accurately machined inside and out for uniform thickness. This results in uniform heat transfer as there are no porous spots, thin spots, or distortions. And, when sleeves are removed for an overhaul, the entire interior of the cylinder block is exposed for a complete cleaning.

Reo Gold Comet power plants truly merit their name—"The Lifetime Engine."



Air Photos vs Tax Maps

A new 16 mm color-sound movie "Airways to Fair Taxes" has been produced by Aero Service Corporation, Philadelphia, photogrammetric engineers, 210 E. Cortland Street, Philadelphia 20, Pa.

The 20-minute film describes how detailed aerial tax maps are used by assessors; how these maps can pave the way for tax equalization programs; and how other groups such as public works officials, traffic experts, and county engineers, can benefit from good tax maps.

ACI Expands Service

The American Concrete Institute has created the staff position of Assistant Secretary with primary responsibility to developing chapter activities. This new job is assigned to Robert E. Wilde who had been managing editor of the Institute's monthly *Journal*.

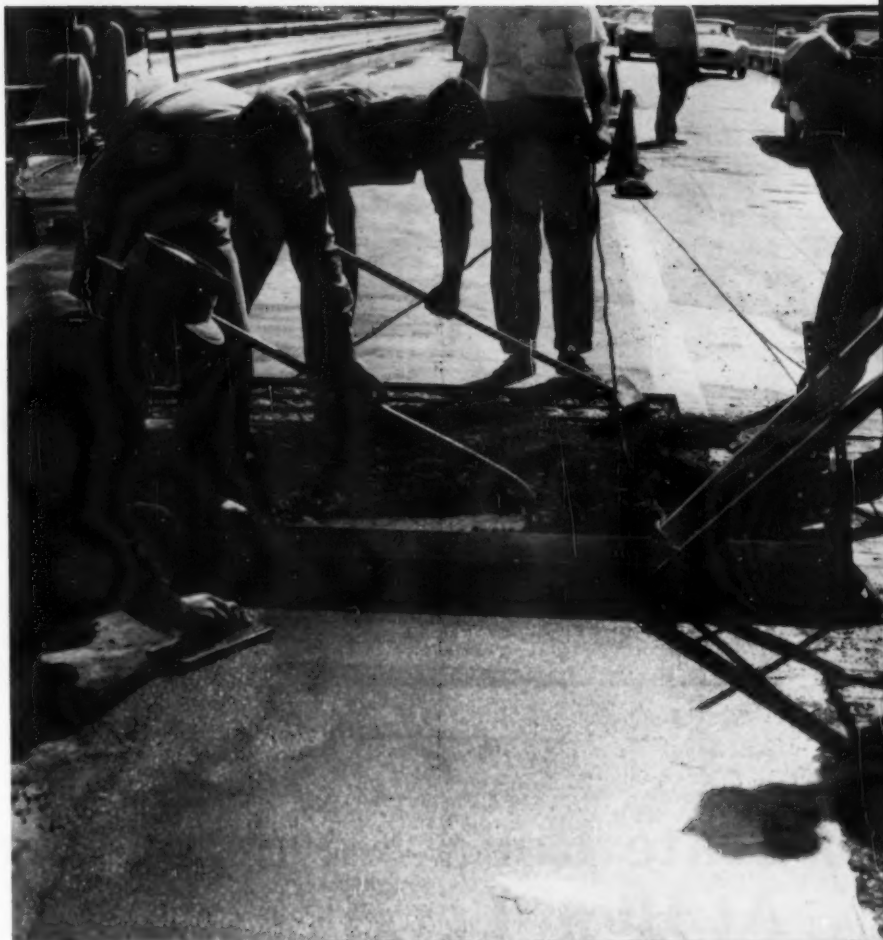
Information Foundation Adds to Staff

The national staff of the Better Highways Information Foundation has been expanded with the appointment of a Director of Information and a Field Coordinator, H. D. Anderson, vice chairman of BHIF announces.

John J. Hassett, veteran public relations executive will be responsible for the Foundation's \$220,000 public information program. His background includes 12 years with national associations and organizations.

Arthur R. Trautmann also joined the national BHIF staff as field coordinator. His job will be to help organize state "better roads" organizations and to serve as liaison with existing groups. He has been field representative for the Associated Pennsylvania Constructors and the Pennsylvania Highway Information Association.

Erskine Stewart, trade association executive, has directed the Foundation through its organizational stage. He will continue as vice president and treasurer.



Adhesive quality of new latex mortar permits placement of thin resurfacings over worn areas.

Fast-Sticking Latex Mortar Repairs Turnpike Deck

Spalled deck areas on an Ohio Turnpike bridge were recently repaired using a relatively new, experimental mortar. The material used was a portland cement composition modified with a latex designed by The Dow Chemical Company.

Surface preparation time was minimal and the repair of about 420 sq. ft. of spalled area was completed in 4½ hours. The turnpike's maintenance crew found the latex modified mortar easy to place and screed. Traffic was kept off repaired

areas for 72 hours.

Latexes are water dispersions of polymer (plastic) particles. The latex used at this bridge (at Milepost 99) is reported by Dow to greatly improve adhesion, tensile strength and flexural strength of conventional portland cement mortars. Compressive strengths are doubled, tensile strength and adhesion quadrupled. This means that thin ½-in. resurfacings with the latex modified mortar are possible and that a high profile of physical properties can be expected.



Some of Michigan's job-hungry contractors at the big December letting. Michigan along with some other states closed the calendar year with a big burst of job awards.

State Road Awards to Continue At High Level

State road job award volumes continue to see-saw in individual states, but taken nationally they're up a healthy one fourth for calendar 1960, compared with the year previous. And 1961 calendar-year awards of state road construction contracts promise to equal or slightly exceed 1960's unexpectedly large total.

This is the picture gained from the latest round-up of state road award figures by the Roads and Streets Editors. As detailed in the accompanying table, jobs placed with contractors in 1960 were expected (as of December 15) to aggregate \$3.96 billion. This total a 24 percent jump, compares with \$3.2 billion for calendar 1959 (representing updating of the \$3.049 shown in the table, as reported some months ago to Roads and Streets). And it compares with

\$4.2 billion in 1961 jobs, this being an early "guesstimate" of the work which state highway departments hope to award in the calendar year ahead.

These figures are for *contract construction only*—right-of-way and engineering not included. They represent all state-awarded work, with or without federal participation. These figures are not to be confused with somewhat larger total figures which may be published currently, taking in overall road expenditures by the states, or for all government levels. The accompanying figures, covering Interstate, ABC and other state work, are presented in the belief that they represent a useful picture to highway industry people who are asking, "How is the road program coming along in terms of contractor jobs?"

Nor do these figures reflect payments to contractors, or the mere availability of funds. They simply show what work contractors have been given recently or can look forward to getting in the state road programs.

The table in this issue is an updating of the similar table carried in Roads and Streets in October (pages 69-70). The latest table verifies or adjusts the earlier estimated figures, giving actual or final sums in many instances, reportable at deadline time (December 15).

Individual state programs have indeed suffered drastic upward and downward swings. Again the Editors join leaders in all segments of the highway equipment and materials industry, as well as benighted state highway administrators, in hoping that Congress will help put fund flow on a more even basis,

State Highway Contract Awards

As reported by the highway departments to Roads and Streets

State	Calendar 1959	Calendar 1960			Calendar 1961	
		3rd Quarter (Estimated)	4th Quarter (Estimated)	Entire Year (Estimated)	1st Half (Estimated)	Entire Year (Estimated)
Alabama	\$ 63,047,497	\$ 25,503,566	\$ 17,815,769	\$ 86,049,315	\$ 45,000,000	\$ 90,000,000
Alaska	-	3,000,000	4,000,000	11,500,000	20,000,000	35,000,000
Arizona	32,818,296	9,160,000	14,000,000	38,236,000	22,000,000	46,000,000
Arkansas	54,686,600	6,070,550	14,315,000	42,615,000	25,000,000	45,000,000
California	221,667,500	97,284,900	104,370,000	390,000,000	200,000,000	370,000,000
Colorado	24,059,536	16,419,563	4,173,953	42,138,669	22,830,478	42,500,000
Connecticut	53,297,942	6,504,540	6,700,000	25,800,000	40,000,000	68,000,000
Delaware	7,811,778	- (1)	600,000	1,500,000	11,000,000	17,500,000
Florida	112,048,000	21,004,225	12,225,118	88,316,000	50,000,000	100,000,000
Georgia	64,800,000	18,880,500	35,520,000	82,000,000	56,000,000	100,000,000
Hawaii	6,681,119	6,979,000	1,325,000	10,961,000	5,624,000	16,035,000
Idaho	16,626,219	2,916,512	6,208,659	20,790,213	18,000,000	37,700,000
Illinois	204,498,000	65,840,000	38,495,000	227,747,000	-	200,000,000 (2)
Indiana	44,036,083	38,605,598	8,951,800	96,200,000	48,000,000	98,750,000
Iowa	71,803,872	21,214,800	17,715,200	84,681,000	50,100,000	85,200,000
Kansas	53,171,828	20,872,566	14,510,573	67,059,217	37,000,000	71,000,000
Kentucky	62,905,575	21,000,000	28,000,000	71,000,000	21,000,000 (2)	71,000,000 (2)
Louisiana	86,837,115	17,872,201	17,000,000	96,000,000	54,000,000	96,000,000
Maine	15,104,417	4,200,000	19,000,000	22,700,000	9,700,000	21,000,000
Maryland	31,913,186	10,756,000	10,500,000	43,789,000	28,000,000	54,000,000
Massachusetts	92,314,000	45,213,000	2,658,000	63,000,000	28,700,000	83,000,000
Michigan	138,347,137	39,265,021	109,000,000	271,891,477	111,000,000	235,000,000
Minnesota	55,851,887	15,042,852	20,162,859	58,686,889	23,224,545	53,355,000
Mississippi	45,192,000	8,538,900	21,524,000	49,042,300	9,473,200	31,340,500
Missouri	71,128,837	20,898,316	30,798,500	114,360,000	70,000,000	140,000,000
Montana	20,621,116	4,541,747	4,000,000	32,000,000	30,000,000	50,000,000
Nebraska	32,328,082	5,008,890	13,000,000	40,329,293	19,000,000	38,000,000
Nevada	7,560,860	2,811,920	3,500,000	14,400,000	8,500,000	19,500,000
New Hampshire	19,443,000	4,899,258	8,427,509	22,831,612	15,225,000	27,000,000
New Jersey	51,589,789	20,300,000	41,400,000	83,000,000	77,000,000	83,000,000 (2)
New Mexico	21,796,752	9,666,269	5,867,168	35,353,360	24,000,000	46,000,000
New York	228,830,926	74,371,586	106,500,000	291,859,728	140,000,000	300,000,000
North Carolina	60,100,180	14,121,697	11,826,420	47,701,337	30,000,000	54,465,000
North Dakota	35,472,149	3,852,000	7,595,000	27,518,000	9,200,000	11,000,000
Ohio	125,065,342	40,552,872	101,053,922	220,850,780	81,900,000	188,900,000
Oklahoma	25,386,726	13,487,033	15,643,322	45,314,143	23,000,000	45,000,000
Oregon	33,149,808	12,969,000	11,009,000	58,055,000	30,000,000	55,000,000
Pennsylvania	61,437,896	45,995,621	43,449,914	170,893,308	63,000,000	170,000,000
Rhode Island	5,225,744	466,835	4,586,516	10,016,403	7,446,500	12,425,075
South Carolina	55,705,168	10,600,000	7,000,000	42,000,000	30,000,000	53,000,000
South Dakota	32,965,278	17,727,665	9,250,000	46,312,500	19,000,000	42,000,000
Tennessee	52,471,574	15,027,618	22,395,590	78,751,187	40,545,100	85,196,750
Texas	254,457,561	60,600,228	50,765,657	224,587,069	126,000,000	252,000,000
Utah	28,000,000	6,123,600	5,561,924	22,034,848	27,022,000	27,000,000
Vermont	29,916,000	3,730,000	3,225,000	17,537,000	14,000,000	21,000,000
Virginia	41,911,432	28,738,594	15,189,000	93,860,650	68,000,000	120,000,000
Washington	46,906,000	38,457,716	9,169,200	70,554,616	30,000,000	64,000,000
West Virginia	28,033,000	5,475,700	10,549,900	30,451,000	25,664,000	55,550,700
Wisconsin	64,578,000	30,000,000	15,000,000	68,000,000	48,000,000	96,000,000
Wyoming	32,634,707	8,226,977	6,540,931	32,520,466	19,000,000	38,000,000
District of Columbia	23,552,025	4,900,000	7,400,000	28,400,000	13,400,000	32,000,000
TOTALS	\$3,049,787,539	\$1,026,295,436	\$1,099,375,404	\$3,961,195,891	\$2,024,553,623	\$4,193,418,025

(1) Ran out of funds.

(2) 1961 figures repeated here by the Editors to round out this estimate column.

permitting better planning and work anticipation by all concerned.

Some of the states, having been cut back severely under "contract controls," have swung back up or plan to do so in 1961, in their awarding volumes. For example:

Dollar-wise California led the parade in calendar 1960 by awarding \$390 million in jobs, compared with \$221.6 million the year previous. The state will drop back only

slightly in 1961, to a \$370 million letting program.

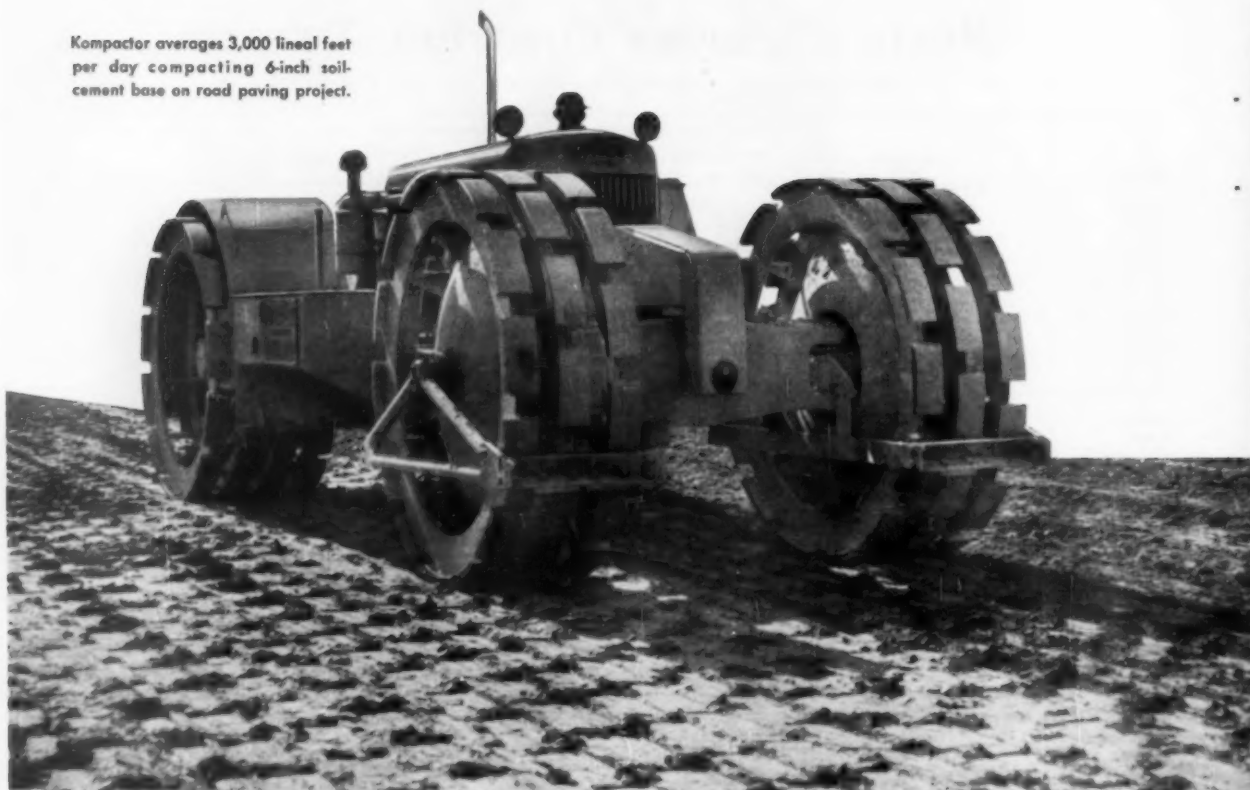
Michigan was also a spectacular gainer, placing \$271.9 in jobs in the year just ending, compared with \$138 million in 1959. Michigan, too, will drop back a bit in its 1961 pace, to a probable \$235 million. Michigan's year ended with a big bang, in the form of a \$42 million letting, one of the largest in state highway department history.




Ohio which has been out-front in the Interstate program all along, ended its award lull of 1959 (\$125 million) with \$220.8 million volume in 1960. And Ohio will continue strongly in the new year with an anticipated \$188.9 million of awards.

Missouri has snapped back, from a low in 1959 of \$71.1 million to \$114.3 million in 1960 and plans

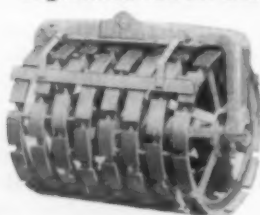
Continued on page 94

Kompactor averages 3,000 lineal feet per day compacting 6-inch soil-cement base on road paving project.



A ROLLER THAT'S JUST RIGHT FOR YOU!	 Small tandems	 Two-axle tandems	 3-wheel rollers	
Capacities	3-5 TON TANDEM 4-6 TON PORTABLE	5- 8 TON 8-10 TON 8-12 TON 10-14 TON	10-14 TON 12-15 TON	
Type of compaction best suited for	Roll and run jobs — driveway, parking lot and playground work. Patching, light finishing.	Heavy-duty surface finishing of asphalt. Sealing off fill surfaces. Compacting granular soils.	Fine grade finishing. Handle a variety of materials in fills, subgrades, and unfinished bituminous pavements.	
Outstanding Features	Two speed mechanical transmission. Hydraulically powered towing wheels on 4 to 6 ton Portable.	Dual control. Adjustable bevel gear final drive. Single unit power train. Low maintenance.	Heavy-duty power brakes. 4-Speed transmission. Easy access to all working parts.	

Segmented roll for Buffalo-Springfield Tandem Rollers provides 3 to 7% higher compaction densities.







A quick change of guide rolls on any big Buffalo-Springfield tandem roller can give you up to 7% higher compaction densities on stabilized base materials, crushed stone, earth fills, etc. You get the special advantages of a projecting-lug roll, plus those of a smooth-faced roll in a single pass — at very low cost!

How to Pick COMPACTION EQUIPMENT That Best Fits Your Needs

No matter how complex your problems are, you can buy with confidence from Buffalo-Springfield. Compaction is our business. Our line is most complete. And with a wealth of past experience to draw on, we can help you pinpoint the most profitable compaction piece

to fit your particular needs. Talk it over with a Buffalo-Springfield man soon. Let him show you how to make your compaction dollar meet density specs in fewer passes . . . with less maintenance and downtime. Ask your Buffalo-Springfield man for complete information.

			
3-axle tandems	Vibratory roller	Kompactor	Pneumatic Rollers
13-20 TON	15-21 TON	K-45 . . . 16 TON	3-10 TON 10-30 TON
Asphalt finish-rolling. Sealing fill surfaces. Compacting granular soils, stabilized base courses.	Compacting base course, surface sealing, and ideal for a large variety of granular base material compaction problems.	Handles wide variety of materials in base fill compaction, at high speed.	Heavy duty force account compaction. Compacted embankment work. All types of soil.
Walking beam control for extra compactive effort. Hydraulic control for raising center roll.	Delivers 1500 to 2200 vpm. All vibratory effort is exerted downward for greater density in deeper lifts.	Segmented wheel roller. Works on interrupted pressure principle. Delivers higher densities in fewer passes.	All wheel oscillation. Torque converter drive. Power steering and brakes. 3-Speed transmission.

Write for bulletin on the compaction equipment of your choice or see your distributor soon.

BUFFALO-SPRINGFIELD CO.
Springfield, Ohio

A Division of
KOEHRING
Company

B100

. . . for more details circle 309 on enclosed return postal card

ROADS AND STREETS, January, 1961

More proof that...

**AMSCO HELPS YOU
HANDLE MORE TONS
PER DOLLAR**



Chuck Weinke, shop superintendent (left) and R. J. Bakken, welder, with Amsco tooth which has just been repointed. Teeth are retipped with repointer bars welded on with Amsco Nicra Mang and hard faced with Amsco #20 electrodes. This combination produces stronger welds, less cracking and longer wear.

*Where equipment works
mainly in rock...subject to
severe abrasion and shock...*

*Here's the way
AMSCO users talk...*

"BEST BUCKET AND BACKHOE EVER PUT OUT"

That's operator language from experienced users of Amsco equipment at Ashbach Construction Co., St. Paul, Minnesota. Chuck Weinke, Shop Superintendent... Ray Reichow, foreman, and Elmer Ahlschlager, shovel operator... all agree that Amsco dippers, backhoe buckets and dipper teeth are the best they've ever used.

Ashbach does highway, bridge and dam construction throughout the U. S. Much of its work is in rock, so the firm is specially equipped to handle jobs involving severe abrasion and shock. And that's where Amsco shines!

Chuck Weinke, shop superintendent sums it up this way: "The reason we use Amsco products is the long life of the bucket and easier application in welding the teeth. There is so little maintenance in comparison to competitive makes."

Let us give you the service life story on Amsco Manganese Steel Dippers, Backhoe Buckets and Dipper Teeth. Contact your Amsco representative, or write us direct for technical bulletins.

*Trade Mark Registered

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

Other plants in: Denver • Los Angeles • New Castle, Delaware • Oakland, California • St. Louis

Welding products distributed by Canadian Liquid Air Co., Ltd.



... for more details circle 276 on enclosed return postal card



Ashbach Construction Co. shovel, equipped with Amsco Backhoe Bucket, on a road construction job at Fort Snelling, Minnesota. Note rocky terrain.



Russell J. Masters, left, and Elmer Ahlschlager, shovel operator, checking the Amsco teeth on an Amsco Dipper.

Contractor Tells Safety Congress—

'Our Safety Program Has Helped Profits, Too'

If you want to catch a contractor's ear, tell him about a way to save money. This was the approach used by Don Kaser, president of Kaser Construction Co., Des Moines, Iowa, in his talk at the Highway Construction Session of the National Safety Congress in Chicago.

Kaser's theme was that, like many other contractors, at first he had to be talked into pursuing an active safety program within his organization, but he has found—again, like others—that the benefits have reached even as far as the pocketbook. "We must assume," he said, "that not all contractors are humanitarian, but even the hard-hearted ones are affected by whatever affects their billfolds." And any insurance company, he said, will be glad to demonstrate the financial savings that can accrue from a good accident record.

After citing many of the hidden costs of accidents, Kaser stated that the total traceable savings, both direct and indirect, which his company has made during the past ten years through its safety program are estimated at \$125,000. To gain this, the company has been spending about \$16 per employee per year. He emphasized, though, that the effort put into such a program must be sincere; as evidence of his firm's

earnest approach to the problem, Kaser said his company won both state and national awards for first place in 1952, and it has consistently placed among the top ten percent nationally.

Kaser presented the following steps as the frame around which the company's safety program is built:

(1) Every new employee receives a personal letter from the president in the envelope with his first pay check. This letter stresses the importance attached to the company's safety policies and offers five specific suggestions intended to help the employee work safely on the job.

(2) With each monthly check, every employee receives a tabulation of the days since a lost-time accident has occurred with his construction crews. It is surprising, according to Kaser, how much competition this has built up, safety-wise, between crews.

(3) In addition to the above safety letters, the company prepares other letters for transmittal with checks at other times. These letters may emphasize a theme used in the crews' "toolbox talks." Another topic in these letters which arouses considerable interest is the practice of advising the employees of every fatal construction accident in the construction industry in the firm's home state of Iowa, with the details

on how the accident happened.

(4) Each superintendent delivers a 5-minute "toolbox talk" to his crew during the fourth week of the month. These talks, delivered in the foreman's own words, are prepared primarily from information secured from AGC pamphlets, from other reading and from the company's own ideas.

(5) At every job site there is a large sign showing the number of days since the occurrence of a lost-time accident.

(6) The wearing of hard hats around crushing plants and asphalt plants is enforced, even with visitors. The company also provides employees with goggles, first-aid kits and other safety aids.

(7) Twice during a season, the company holds safety meetings with the employees at the various job sites around the state. These are dinner meetings, with the company picking up the check. (Kaser said he is resigned to the fact that the latter detail is most responsible for the 100 percent attendance. But regardless of the means, he adds, the men still are brought together to talk safety in a congenial atmosphere.)

(8) Each December, at the end of the construction season, a meeting is held at company headquarters in Des Moines for all superinten-

"Tool Box Talk" session in the West Des Moines division of Kaser Construction Co. where Don Kaser puts into practice the ideas he presented at the National Safety Congress.



dents. They are advised of the company's ranking in the state and national safety contests, also the men are given a tabulation of every accident reported in the company for the past year, with a description of the accident, how it might have been prevented and the amount paid out by the insurance company. Safety practices are discussed and plans are laid for the next year's accident prevention program.

Utah's Job Safety Effort

In another presentation at the Safety Congress, Keith M. Macfarlane, safety coordinator of the Utah state road commission asked these questions: Is the government not responsible for a safety program just as industry is? Should states enact legislation for safety in construction? Should safety procedures be written into contracts and standard specifications?

The Utah commission leaders, with other interested organizations, felt the need for a cooperative safety program between the contractor and the commission employees. In September, 1958, the commission authorized the director of highways to appoint a safety coordinator to assist him in setting up a full safety program.

With the appointment of a safety committee, this group's first function was to get a proposed safety

program approved by the state road commission. It was not easy to gain complete backing for such a program, according to Macfarlane, but the obstacles were overcome and a plan, "putting important things first," was okayed.

Since safety must be sold, a 24-hour course in "Problems of Handling People" was presented by the Utah safety coordinator to all highway department supervisors. These classes were conducted in the conference manner, with films and hand-out materials for those in attendance.

A separate 10-hour training course on "How to Set Up a Functional Safety Program in Construction," sponsored by the Utah chapter of the Associated General Contractors of America and the Salt Lake Trade Technical Institute, was presented for contractors in the state. These sessions covered blasting, organizing a safety program, the supervisor's job in safety, the importance of accident reports, and human relations.

The next step, Macfarlane said, was to draw up a state manual for safety in road construction. This manual was required to be as good or better than the general safety orders of the Industrial Commission of Utah, meet the requirements of the Bureau of Public Roads, and

contain rules that could be enforced. It included the establishment of such measures as a uniform flagging system for the state, also more stringent qualifications for flagmen.

The next step was the training of the resident and district engineers, who are responsible for directing and enforcing the Utah standard specifications for road and bridge construction. The safety requirements were something new, so a six-hour training session for these men was felt necessary.

A special mailing to all contractors included explanatory literature on the new safety program and a sample of the forms to be required. A second packet containing a larger supply of these materials is provided the successful bidder at the time of award.

A third presentation at the construction session was a report by J.E.P. Darrell, traffic engineer, Minnesota department of highways, on revisions currently being made in the Uniform Traffic Control Devices manual. This manual (see detailed review of changes in Roads and Streets, October) is a basic reference on recommended signing, marking and flagging on highway construction jobs as well as for general traffic control.

EQUIPMENT FINANCING

Continued from page 37

tractor can bid below normal cost and get by—if his equipment purchases and other cost elements are below normal. "It's impossible for the contractor to make money unless his bid is high enough to make money."

"This remains a very serious subject," Salinger said, "and we aren't at all hesitant about bringing it up. The distributor makes two or three percent before taxes and the financing company makes less, so this whole thing is very close to us."

Salinger expanded on the subject of shaky business arrangements between contractor and dealer. He posed this example:

Bum Deal, Case Example

"Let us discuss Distributor Jones. Say that he makes 100 deals a year at \$30,000 per deal. Now let's assume that two of these deals go bad on him. We will spell out these two arrangements; they are hypothetical but the terms are duplicated countless times every year.

"In these two cases, each contractor talked the dealer into accepting one-tenth of the purchase price in cash. (This actually is more than some distributors are getting these days.) The remaining \$27,000 was to be paid off in five years at \$5,400 per year, with the dealer thus standing the gaff for \$54,000 in these two transactions.

"At the one-year mark, both contractors fall flat and the equipment must be repossessed, the dealer having a remaining investment of \$21,600 in each. After taking a year's beating each of the two \$30,000 mechanical units involved brings \$13,600 in today's rough market. The dealer, therefore, has lost \$8,000 on each of the two deals, in addition to cost of repossession and resale.

"This is going to hurt him," Salinger said, rapping the desk for emphasis. "To make up this \$16,000 loss, he is going to have to get 12 or 13 additional deals to make up the 1/4 or 1/2 million dollar sales volume needed to compensate—profit-wise for him—for the loss incurred on just those two. And make no mistake: the contractors lose, every contractor in that area. Why? Because that dealer is going to raise

his price to try to recoup a bit, and he's also going to tighten his deals. To say nothing of the loss to all the contractors in the area that arises out of the low bids the busted contractors put in, counting on 'cheap' equipment costs."

Salinger remarked that many contractors are improvising, cutting corners, and—a lot of them—skating on thin ice in their efforts to "make do" during this very competitive period. But, he added, they are often unrealistic and thus are their own worst enemies.

"My grandfather had a test for whiskey which went like this: he would give the rabbit a healthy dose and if the rabbit lived, it was good whiskey; if the rabbit died, it was a puny rabbit. Contractors, likewise, are adopting extreme measures these days: if his tricks work, the contractor feels it's a credit to his shrewdness, and if they don't he blames the competitive market. Some try to keep their fleets working by selling odd units. This is not logical because that piece of equipment is still on the market and is now competing directly against him. A number of the big contracting firms currently are bidding on a loss basis just to get the work, figuring that a \$1 million loss is better than an \$8 million loss. And add to these the flimsy financial deals put together so frequently at the time of purchase of major equipment.

"Further, it is short-sighted to ask the finance company to take risks of loss of this nature and to absorb the repossession losses. Some good finance companies, including our own, buy contractor risks non-recourse. But with profit margins narrow, none of the finance companies can afford to absorb disproportionate losses indefinitely. So all suit their credit-passing to the realities of the contractors credit. Therefore the contractor *must* try for a basic profit in his contract. For his own good and that of the business, he must not plan, however indirectly or involuntarily, to lay off his losses on the distributor, nor the distributor on the financier.

What Makes Them Do It?

Why do so many contractors go into these unstable purchase deals?

They are usually unaware, Salinger said, of the disparity between

the cost of the purchase and their own equity base as a contractor. The contractor will go in with \$100,000 cash and try for a million-dollar purchase of equipment.

There's an additional hazard in these very-extended term arrangements, Salinger said, and he mentioned the actual case of another contractor who was trying to keep all his payments as low as possible.

This man was angling for the purchase of a fleet for \$500,000, with a \$60,000 down payment. But in the meantime he found someone else who could sell him the same equipment for \$25,000 down with payments over five years instead of three.

The contractor signed this deal. Today, two years later, he urgently needs to sell the equipment. But he finds now that he owes more on the now-depreciated equipment than it is worth: he owes \$285,000 and can get only \$200,000 for it. And Salinger mentioned here a rule-of-thumb for contractors in planning financing of equipment purchases: never owe more on it than it's worth at any time.

Referring to another danger seen in contractor-dealer relationships, Salinger recalled the old W. C. Fields line as the comic and a friend dropped off a cliff in a basket—"Enjoy the ride; it's only the last foot or so that will give us any trouble." To cut down on the interest of their payments, or to suit an unrealistic seller or financier, contractors often arrange short-term financing consisting of out-size payments—whereas any accountant worth his salt, according to Salinger, could say, "Look, in three months you're going to run out of money; how do you expect to finish out your payments at this rate?"

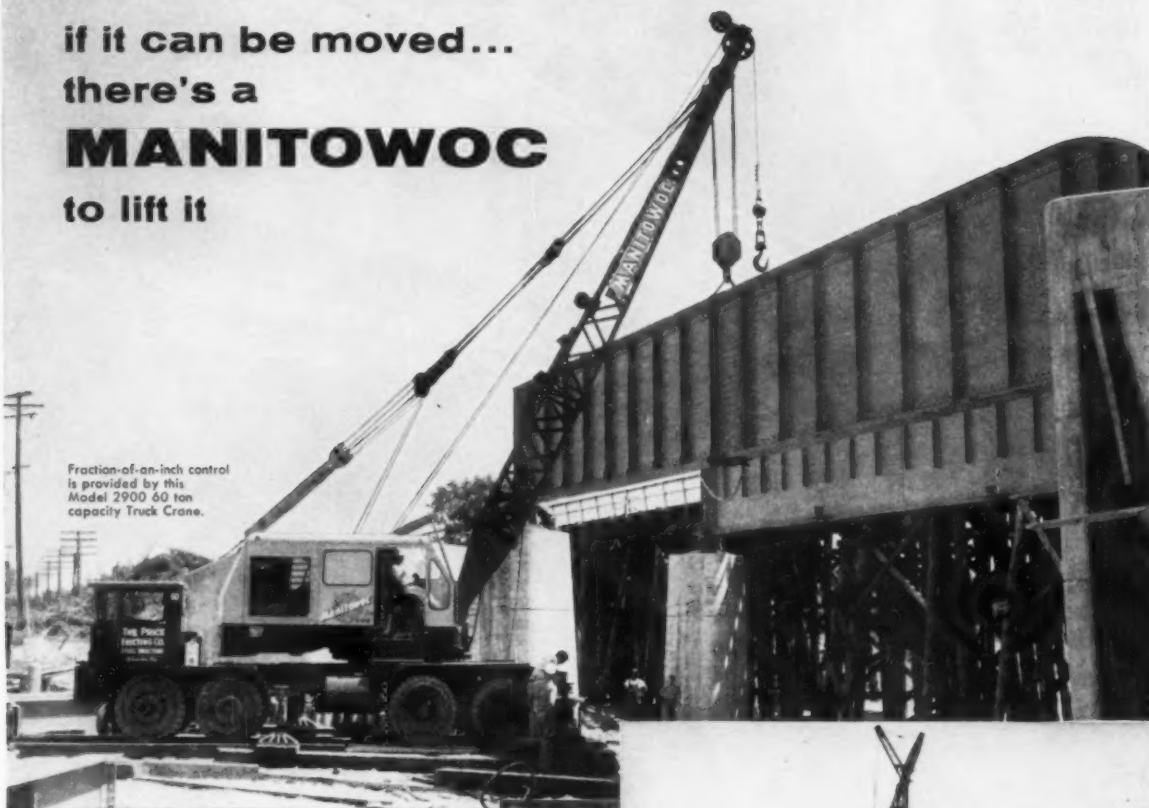
The moral: smaller payments over a longer period will eliminate the chance of a drastic shock at that "last foot or so."

Better Company Planning

One result of naivete, inexperience and poor planning evidenced in many purchase contracts: Some finance companies are hardening their policies. Salinger quoted this anecdote from his youth. His family, on a Cape Cod outing, was ordering breakfast from a crusty, weathered old codger—"What, \$1.50

Continued on page 79

if it can be moved...
there's a
MANITOWOC
to lift it



Fraction-of-an-inch control is provided by this Model 2900 60-ton capacity Truck Crane.

Why have Manitowocs gained a world-wide reputation as the "Cadillacs of construction cranes"? Because contractors everywhere know that on any lift crane job — steel erection, concrete pouring, bridge construction — the work will go faster and easier with a Manitowoc. They know that Manitowoc engineers have been specialists in crane design for over 30 years. They know that quality Manitowoc components will give them years of reliable lift crane service with the least maintenance and time loss.

You get a simple, direct power train that eliminates wasted energy and provides a reserve lift capacity when you need it most. There's outstanding stability from a solid foundation for high, heavy lifts. Smooth performing disc clutches, fast-acting brakes, and 3-stage torque converters help to provide precise, positive control. And you get profitable all-job use because every Manitowoc is easily convertible to clam-shell and dragline attachments . . . several to shovel and trench hoe.

Get more information *today* on the most complete line in Manitowoc's history. Mail the coupon now!

TRENCH HOES
1 1/4 to 3 YDS.

SHOVELS
1 1/4 to 6 YDS.

Manitowoc

CRANES
25 to 125 TONS

DRAGLINES
1 1/4 to 7 YDS.



Unloading steel trusses at the site of Chicago's new Metropolitan Fair and Exposition Center is a 125-ton capacity Model 4000 crane, one of over 100 Manitowocs owned by American Bridge Division of U. S. Steel.

MANITOWOC ENGINEERING CORP.
(A subsidiary of The Manitowoc Company, Inc.)
MANITOWOC, WISCONSIN Dept. RS

Please send details on the following Manitowoc cranes:

CRAWLER-MOUNTED

- ☐ 25 ton ☐ 65 ton
☐ 35 ton ☐ 100 ton
☐ 50 ton ☐ 125 ton and up
☐ 60 ton

TRUCK CRANES

- ☐ 45 ton
☐ 60 ton

Name _____

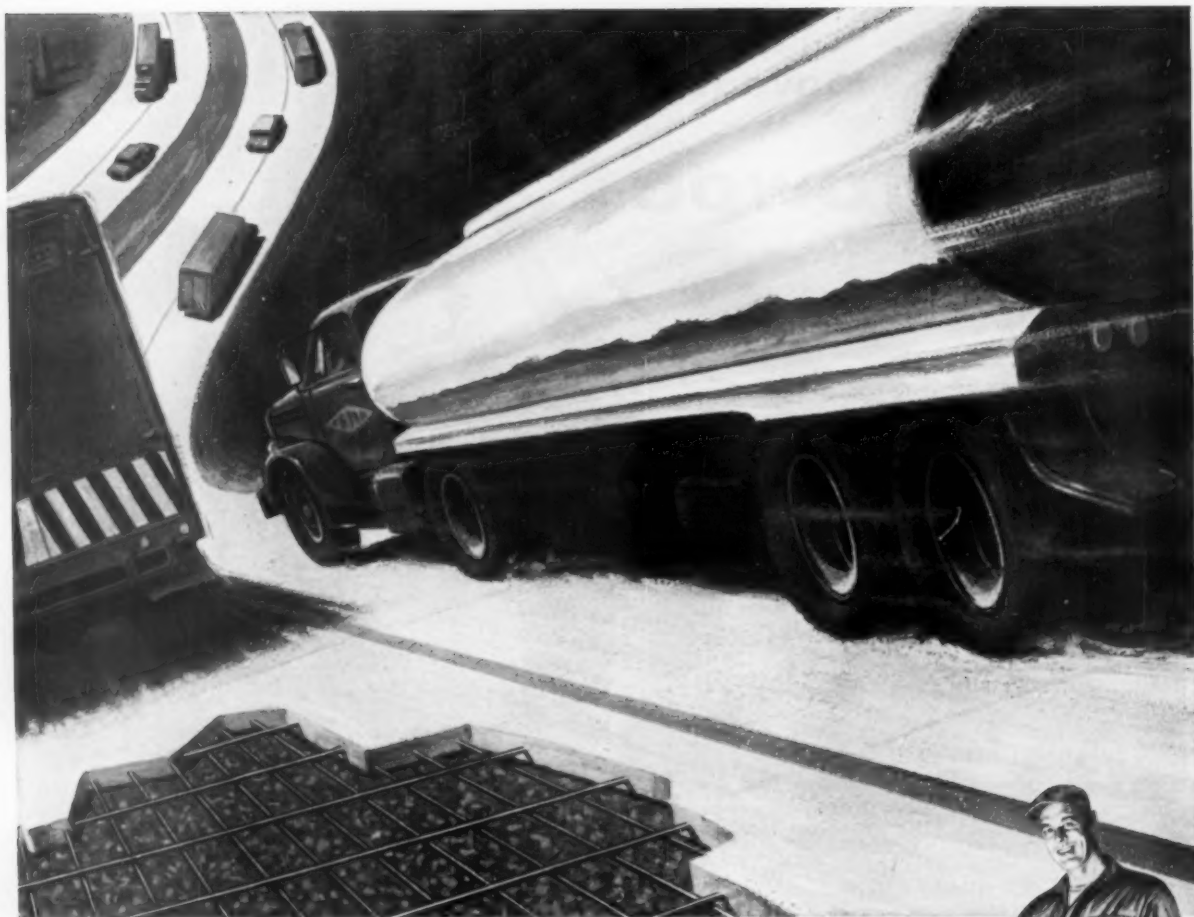
Company _____

Address _____

City _____

Zone _____

State _____



*Roads can take a beating if they're reinforced with **Clinton Welded Wire Fabric***

Pounding wheels, extreme changes in temperature, moisture... these are the elements that concrete highways must be able to withstand. And these are the elements they *will withstand* if they're reinforced with CF&I-Clinton Welded Wire Fabric.

This fabric adds years of life to highways because it

- links together the strength of steel and the permanence of concrete;
- provides an embedded steel skeleton that distributes loads evenly over a wide area;

- helps eliminate cracking and heaving;

- binds together small cracks with fingers of steel, preventing fissures from being expanded.

If you're trying to build better, longer-lasting concrete highways, contact your nearest CF&I sales office before starting your next job. Our engineering staff will be happy to discuss your reinforcing requirements with you. That's one of the meanings of our Corporate Image — the best of service to the concrete industry.

CLINTON Welded Wire Fabric

THE COLORADO FUEL AND IRON CORPORATION



7835

In the West: THE COLORADO FUEL AND IRON CORPORATION — Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Farmington (N. M.) • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita

In the East: WICKWIRE SPENCER STEEL DIVISION — Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

CF&I OFFICE IN CANADA: Montreal

... for more details circle 287 on enclosed return postal card

look familiar...?



Photo Courtesy Bureau of Public Roads, Dept. of Commerce

Icy roads like the one above are quickly changed to safe, bare pavements with Columbia Calcium Chloride-rock salt mixtures.

SKIDPROOF ICY ROADS FAST with Columbia Calcium Chloride-Rock Salt Mixtures

If your winter road maintenance program leaves something to be desired . . . something like bare, safe pavements, chances are you aren't getting the benefits of Columbia Calcium Chloride-rock salt mixtures. No other material gives you these advantages:

BARE PAVEMENT FASTER—Test results (right) prove the ice melting action of Columbia Calcium Chloride-rock salt mixtures.

ALL TEMPERATURE EFFECTIVENESS—Mixtures give quick melt at all temperatures—from freezing to sub-zero.

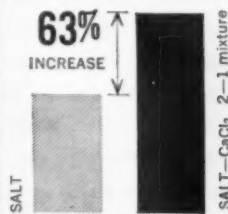
NO MATERIAL LOSS—Columbia Calcium Chloride-rock salt mixtures dissolve quickly, penetrate the ice—aren't scattered by wind and traffic.

SAVE TIME, MONEY—Columbia Calcium Chloride and rock salt mix easily, can be stored outdoors under tarpaulins or in covered sheds and bins. Bulk purchase and storage help stretch maintenance budgets.

Write to our District Sales Office nearest you or to our Pittsburgh address for more information. Do it now before the next snow storm ties up your roads.

Clear pavement area two hours after application of calcium chloride-rock salt mixtures is 63% greater than salt alone in 25-30° temperature range. (Based on field studies in Michigan sponsored by the Calcium Chloride Institute.)

Clear Area Effectiveness



You'll like doing business with Columbia-Southern

columbia | southern
chemicals

COLUMBIA-SOUTHERN CHEMICAL CORPORATION • A Subsidiary of Pittsburgh Plate Glass Co., One Gateway Center, Pittsburgh 22, Pa.
DISTRICT OFFICES: Cincinnati • Charlotte • Chicago • Cleveland
Boston • New York • St. Louis • Minneapolis • New Orleans • Dallas
Houston • Pittsburgh • Philadelphia • San Francisco
IN CANADA: Standard Chemical Limited

... for more details circle 285 on enclosed return postal card



The season's

*Geo. M. Brewster & Son, Inc solution includes use of
one dozer, this big 375 hp Michigan, to spread
25,000 yds daily on 3 fills*

How would you handle a job where the state-specified borrow pit was on an island and the main fill was across 400 ft of river water . . . and where there were no bridges in between?

This was the puzzling problem faced by bidders on a 1,400,000 yd, 4 mile section of Route 129 Freeway near Trenton, New Jersey.

Think about it. What *would* be *your* method of bidding?

Would it be dredging? Some firms figured that way. Or building high trestles above the river to serve as haul roads? Or using barges to ferry fill across the water? Or what?

Flood danger makes speed essential

The successful bidder in this case had a different solution—one as novel as the problem. Geo. M. Brewster & Son,

Inc, well-known Bogota, N. J. contractor, placed their bid, roughly \$4,500,000, on a gamble. They would dam the inside channel of the river on its upstream side, let the water drain, then build several inexpensive earth causeways to the mainland fill area. The question was, "Could they move the necessary dirt quickly enough to avoid high water, yet economically enough to do the job at a profit?" For this river, the Delaware, has been known to rise at least 15 ft above its present normal stage. The bid was low . . . the job won . . . but speed became absolutely vital.

Fast mobile equipment and two 10-hour shifts per day were the basic choice. Yet for economy reasons a relatively small fleet did all work. A tractor-pulled and pushed belt-loader did the loading. Ten 16-yd bottom-dumps moved the fill. One machine—a high-speed 375 hp Michigan



most unusual job

Model 380 Tractor Dozer—handled *all* spreading.

Michigan replaces 2 or 3 crawlers

Brewster figures that because of its 25 mph speed and its power, the big Michigan replaced two or three large crawler dozers. *Working alone, it easily handled three separate dumping areas.* One pass forward leveled each long line of dumps . . . one in reverse back-bladed . . . then the Michigan would drive to another fill area where the operation would be repeated.

Tires help compaction

In this way, the one 375 hp unit took care of all 10 haulers and all fills. It regularly spread 25,000 yds of soft silty sand every 20-hour day. Despite high production demands, it even had time to clean up and make extra compaction passes. In fact, Brewster figures the large low-pressure tires on his 75,000 lb Michigan did the bulk of the compacting—even though the New Jersey Highway Department required final use of vibrating rollers.

. . . for more details circle 284 on enclosed return postal card
ROADS AND STREETS, January, 1961

Unit also reduces maintenance

In the final analysis, dirtmoving completed long before flood season, use of the big Michigan had cut costs in some extremely important ways. One, it alone did the work of several of the biggest crawler-dozers. Two, it completely eliminated track maintenance and repairs, which in sand like this, could total \$10 per hour, or more! Three, it proved versatile enough to spread gravel sub-base as well as sand fill, handle emergency truck towing, and do much of the compaction on all 3 fills.

Michigan job-proved Tractor Dozers could do the same for you! Pick the size to fit your job—162, 262, 375 or 600 hp—then call your Michigan Distributor for a demonstration. You name the time and place.



Michigan is a registered trademark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division
2497 Pipestone Road, Benton Harbor 16, Michigan
In Canada: Canadian Clark, Ltd., St. Thomas, Ontario



Mack diesels get more jobs done in less time. Macks last longer, with less downtime—a most important consideration in the concrete-mixer field. That's been the experience of Denver's Pre-Mix Concrete whose B-61 Model Mack is shown here ready to deliver concrete on an addition to a sewage treatment plant in Aurora, Colorado.



In Denver—concrete means Pre-Mix and Pre-Mix means MACK

Where there's big concrete work in the vicinity of Denver, chances are good you'll find Pre-Mix Concrete Co. and its fleet of Mack trucks on the job. Since buying its first Mack gasoline-powered six-wheeler, Pre-Mix has purchased over 50 more—the most recent being 10 diesel-powered units.

Why is Pre-Mix changing to Mack diesel? Because its Thermodyne® diesel engine operates on one-half the fuel costs of other trucks, hauling payloads of up

to 30,000 lbs. over mountainous terrain with grades up to 12%, as well as on congested city streets. They average a legal 55 mph in highway travel and really get up and go in city traffic.

Other major Mack diesel advantages reported by Pre-Mix are greater dependability... far better performance... much less routine service... and complete driver satisfaction.

Mack has the right mixer or dumper for your operation, too. Ask your Mack

branch or distributor for the names of satisfied operators, like Denver's Pre-Mix Concrete Co., who have discovered the economy and endurance of Mack trucks for themselves. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

7982

MACK
FIRST NAME FOR
TRUCKS

... for more details circle 317 on enclosed return postal card

EQUIPMENT FINANCING

Continued from page 72

for bacon and eggs? Are eggs that scarce?"

"Nope. Eggs ain't, but tourists be."

And it's not that there are too few finance companies, Salinger said, but rather some inexperienced ones are finding out the opportunities for sound contracts between purchaser and dealer are proportionately fewer than they had hoped for. Thus contractors feel they are meeting some unfair dealer financing programs, whereas in many of these the dealer would say he is only trying to cover himself for the risks he is taking.

What is the Heller Company's opinion of these conditions and trends?

"The rate structure in this field is not high, and the equipment dealer and the contractor cannot be permitted to feel that the basis can be anything but 'business—good busi-

ness'. One thing we can never do is try to play credit against the law of averages.

"Of the two parties, we work mostly with the distributor; with the contractor too when we feel there is a constructive basis—which does occur rather frequently. During the last six months of 1960, we had a great increase in loan applications from both distributors and contractors. The reason may be that other sources of credit and some dealers and manufacturers are feeling the pinch: they have had quite a few risks turn out bad lately."

Salinger was asked his opinion as to the current reputation of contractors in the construction business.

"Twenty years ago contractors had a miserable reputation for loans. Bankers and other lenders usually gave an outright 'no'. But since World War II this industry has come into its own, and many bankers and finance houses consider it good. Those who know the construction industry finance business

and are geared to handle it, like it.

"The reasons for this? Distributors give more service, better maintenance; some of the big ones even do their own research work.

"Factories do a better job of back-stopping their distributors. Also we must mention the excellent quality of the equipment sold today. And another factor is the co-operation between competing firms through associations and other business tie-ins; this would have been unimaginable a generation or two ago.

"But to us, the big reason for the growth to eminence of the construction industry is the contractor himself. He is more knowledgeable, more assured, a better businessman. And these young second and third generation fellows are sharp. They may not wear galluses or chew tobacco but they know better how to figure costs. They aren't as salty as their fathers but they have more education. And with them in charge of things, we figure that the reputation of the construction business is going to continue to rise."

New Publications

Soils Manual for Water Control Structures

Earth Manual. 1960 edition, published by the U. S. Bureau of Reclamation. 750 pages (4½ x 7½). Price \$3.75 postpaid. Obtainable from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., or from the Bureau of Reclamation, Denver Federal Center, Desk 841, Denver, Colorado.

Succeeding the 1951 edition which became a world-wide reference this manual was edited under assistant commissioner and chief engineer Grant Bloodgood aided by numerous staff engineers which included F. C. Walker, J. W. Hilf and W. W. Daehn of the earth dams section; W. G. Holtz and A. A. Wagner of the earth laboratory branch; and E. H. Larson, head of the manuals and technical records section.

The new edition technically covers field and laboratory investigations of soils used as foundations and materials for dams, canals and many other types of structures built

on reclamation projects in the United States.

Chapter I describes the Unified Soil Classification System developed jointly by the Bureau of Reclamation and the Army Corps of Engineers. Chapter II covers investigations of soils; Chapter III, the control of construction from the soils standpoint, for both foundation treatment and compaction control of fills.

ASTM Bituminous Road and Roofing Standards

Compilation of ASTM Standards on Bituminous Materials for Highway Construction, Waterproofing and Roofing (D-4, D-8). 474 plus xii pages, hard cover, 6 x 9". Price \$5.50. American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pennsylvania.

The 1960 edition of this reference contains over 100 specifications, methods of tests and definitions, as a guide for the production and use of bituminous materials both in

highway and in building construction.

Over 40 standards are new, revised or have had their status changed since the 1958 issue. Among the newly added standards are: Specifications for Asphalt Paving Mixtures, Hot-mixed, Hot-laid; Specification for Woven Glass Fabrics Saturated with Bituminous Substances for Use in Waterproofing; Method of Test for Coating and Stripping Bitumen-Aggregate Mixtures; and Method of Test for Failure End Point in Accelerated and Outdoor Weathering of Bituminous Materials.

ECONOMIC ANALYSES IN HIGHWAY PROGRAMMING, LOCATION, AND DESIGN. Workshop Conference proceedings (September, 1959). Highway Research Board, Special Report 55. Available on request to the Board at 2101 Constitution Avenue, Washington 25, D.C. Price \$4.00. This 190-page report covers voluminous papers and discussions held in the Conference's five sessions.



Three Cat 14 motor graders were used, one seen fine grading as contractor's men string line the finish grade. Also Preco equipped Cat 12 motor grader fine graded the select material required in the top 1 ft. of the roadbed; required to be within a tolerance of 0.05 ft.



Sheepsfoot rollers were used to compact the heavier soils where air-on-the-run had no particular advantage.



Case model 520 tractor pulled Bros pneumatic roller for initial compaction of select surfacing of the subgrade.

AIR-ON-THE-RUN

Continued from page 40

all at his own expense; or (2) If the underlying roadbed was constructed under a previous contract, make roadbed repairs as the engineer directs at the state's expense."

Where the contractor test rolls areas which were constructed under a previous contract the state measures the length in road stations of 100 ft., and test rolling is made a bid item of the contract. Where the roadbed tested is constructed by the contractor under the same contract, test rolling is not considered a pay item but as incidental work, and no direct compensation is made.

Resident engineer Methven on the Alley-Hodgeman project stated that he felt that the effect of the test roller ordinarily was exerted to a depth of 4 or 5 ft. This engineer is enthusiastically in favor of test rolling and feels that it is a valuable tool in assisting the engineers in securing quality control. Methven pointed out that his crews ran moisture and density tests as spot checks to the fullest extent which the available personnel would allow. The average was a density and moisture test at approximately each 1/2-mile interval for each layer. He observed that the test rolling specification will penalize the contractor who cuts corners, i.e., who allows unsuitable material to be incorporated in the fill. Contractors are encouraged to keep the grade smooth and sloped for adequate drainage at all times.

From watching the test rolling of a quarter-mile section on this job, it was quite evident that a great deal of judgment and experience will have to be exercised by the inspector in assessing the effect of the test rolling. The section in question appeared firm and carried heavy haul equipment with no difficulty. While the test roller left no particularly visible indentations, the material did heave sufficiently under the roller so that this stretch was rejected. Methven explained that this area would have to be sub-cut about 4 ft. and that the wet material would have to be taken out, aerated, dried, and replaced under proper compaction.

In explaining the inspector's role in test rolling, Methven said that the first step was to place the test roller on a paved or other hard

surface so as to enable the inspector to measure from this hard surface to some fixed point on the roller to get an index to show the condition existing under an ideal situation. He also pointed out that when the roller was in actual operation on a stretch of fill, unstable material had a tendency to bounce back and not leave a noticeable indentation. For this reason the measurement of the indentation was taken with the test roller tire in place. Methven was in hopes that the equipment manufacturers would perfect a telltale device which would either ring a bell, light a light, blow a horn, or in some manner give a positive indication to the inspector at any time when the tire had exceeded the allowable penetration.

Methven went on to explain that test rolling showed failures usually to exist only in isolated spots and that most of the failures occurred near the shoulder line. Methven's experience was that it took only one or two failures to show the contractor that it was necessary to secure, as nearly as possible, homogeneous material in the fill. He stated that a number of contractors were using big discs behind a sheepfoot roller to make certain that the various types of material were well mixed. These 24 to 30 in. discs have helped aerate wet soils and did not impose too much of a load behind the sheepfoot.

The exacting new test rolling specifications can result in somewhat higher bid prices, the Minnesota engineers foresee. Alley's bid price for excavation on this project was not considered realistic; this contractor at time of bidding did not have a full realization of the impact of test rolling. On the other hand, as the Minnesota contractors gain experience they will possibly take the necessary steps to guard against failures. Resident engineer Methven's prediction is that there will likely be no great increase in cost, but a considerable increase in the quality of the work, from test rolling.

Contractor-superintendent Parker's reaction to the tighter specification was somewhat different. His company was getting some rather costly experience in this first project involving test rolling. He felt that test rolling may prove to be a costly item, particularly when it is

combined with finish grade tolerances of 0.05 ft. "Someone will ultimately have to make a decision as to how far to go with compaction and tolerance requirements as balanced against the economics of highway construction," was his thinking. This contractor performed no check rolling on its own to test the grade as it was built up.

Sixteen men were used in the surveying and inspection of this 10.7-mile project. Five men were assigned to inspect the grading; five men to inspect base; and he had two survey parties.

One of the contractor's problems centered around the specification

requirement that the top 1 ft. be Class A excavation consisting of sand or gravel from state designated sources. The pit designated for this project produced a loose type of sand. It took careful work by the contractor to accomplish the required surface tolerance of plus or minus 0.05 ft.

In dividing up the work on this joint venture contract, Alley Construction Co., did the grading and the select surfacing. Hodgeman placed the base and surface course. This project was carried out under the general supervision of district engineer G. F. Welch.

Test Rolling Can Fill Inspection Gaps

Supplementing the foregoing are the following general notes pertaining more broadly to the test rolling experience to date on Minnesota state highway work.

Test rolling was introduced into the Minnesota specifications within the last two years. During this time the engineers and contractors have had enough experience with this specification to allow them to assess its affects.

The consensus of the Minnesota state engineers is that it is a valuable tool in the quality control of embankments. On all of the projects which this observer visited during the 1960 summer, the engineers were performing moisture and density tests as rapidly as available personnel would permit. On one particular project this averaged about one test per half-mile for each layer placed in the embankment. While grading inspectors were assigned to all projects, it was physically impossible for them to personally observe all of the contractors' operations. The impression was gained that test rolling filled in the gaps where on-the-spot inspection was impossible. In other words, where the contractor used poor material or poor construction methods, the resulting defects would show up in the test rolling.

C. K. Preus, materials and research engineer, pointed out that

test rolling would ordinarily be used only on highways involving a 9-ton axle load; and would not be used on the state's 5 to 7-ton highways. Experience had shown conditions to differ from job to job. Preus cited one project which was graded in the fall and test rolled in the spring. In this instance it was necessary to rework the material in order to secure the proper compaction. In another instance, the project laid over the winter but when the grade was allowed to dry out it passed the test rolling without much manipulation. Preus considers this part of the specification as purely for testing purposes and not for initial compaction.

Ellsworth Johnson, assistant district engineer for the Minnesota metropolitan district feels that test rolling has already gone a long way to improve the construction practices of Minnesota contractors. Prior to the adoption of test rolling, many contractors' supervisory personnel had not worried particularly about getting one or more loads of peat or other unstable soil in the embankment; they figured that such a small amount could make little difference. They were also prone to allow moisture control to vary considerably from optimum in isolated areas. Johnson found that, after a few experiences where test rolling revealed

these poor practices, the contractors' men took measures to insure against a repetition.

Johnson believes that one of the most effective means of securing a homogeneous embankment material is the use of 24 to 30 in. diameter heavy discs behind a sheepfoot roller. Roger Methven, resident engineer, concurs.

There was a wider difference of opinion between the contractor owners and their supervisory personnel. One contractor stated that he felt the requirements were far too severe and that there was at least a possibility that this requirement would price excavation out of the market. Minnesota specifications require the top 12 in. of the roadbed to be select material of a granular nature secured from state designated pits. This contractor sees that the high compaction requirements together with toler-

ances of 0.05 ft. will call for greater care on the part of the engineers in picking the source of this select material. On the other hand, another contractor told this observer that "test rolling is no great hardship on the contractors. Most of them have learned rapidly by experience the things to look for which might result in test rolling failure."

From the interviews conducted, there seems to be little doubt but that contractors will need an education in modern compaction and compaction equipment, if they are to avoid the penalty of reworking material which fails under the test rolling. It can probably be expected that costs will go up slightly, but it is doubtful that this will be much of a factor after the contractors have learned to cope with the problems. There seems to be no question that test rolling is a

boon to the resident engineer and his limited personnel. In essence, the test roller operator is continually "looking over the contractor's shoulder."

A number of contractors have constructed their own test rollers. The specification requires a loading of 15 tons on each of two wheels on one axle. On the other hand, several contractors have used existing self-propelled pneumatic rollers for test rolling, by removing some wheels so that they get the required loading on two remaining wheels. The tire pressure is usually in the order of 100 psi.

Roger Methven's idea of some telltale device to automatically call the inspector's attention to a failure will probably be followed up by one or more manufacturers. He feels that such a device will reduce the human element in assessing test rolling.

Job and Equipment Ideas



Safety reminders stenciled where they do the most good.



Safety Reminders Stenciled Where They Count

The two legends, "Watch for Overhead Wires" and "Caution, Wide Load", as pictured here, are stenciled on the back and front respectively of the apron of a Michigan 280 rubber tired dozer.

This machine was in use as a stockpile unit of the desert project of E. L. Yaeger & Company, contractors of Riverside, California.

This firm is placing 280,000 tons of asphaltic mix in a big project north of Baker, Calif.

The reminder about overhead wiring was necessary because this machine darted in and out of the plant setup, where hundreds of feet of electric cable was strung out to motors for powering belts, screens and other units.

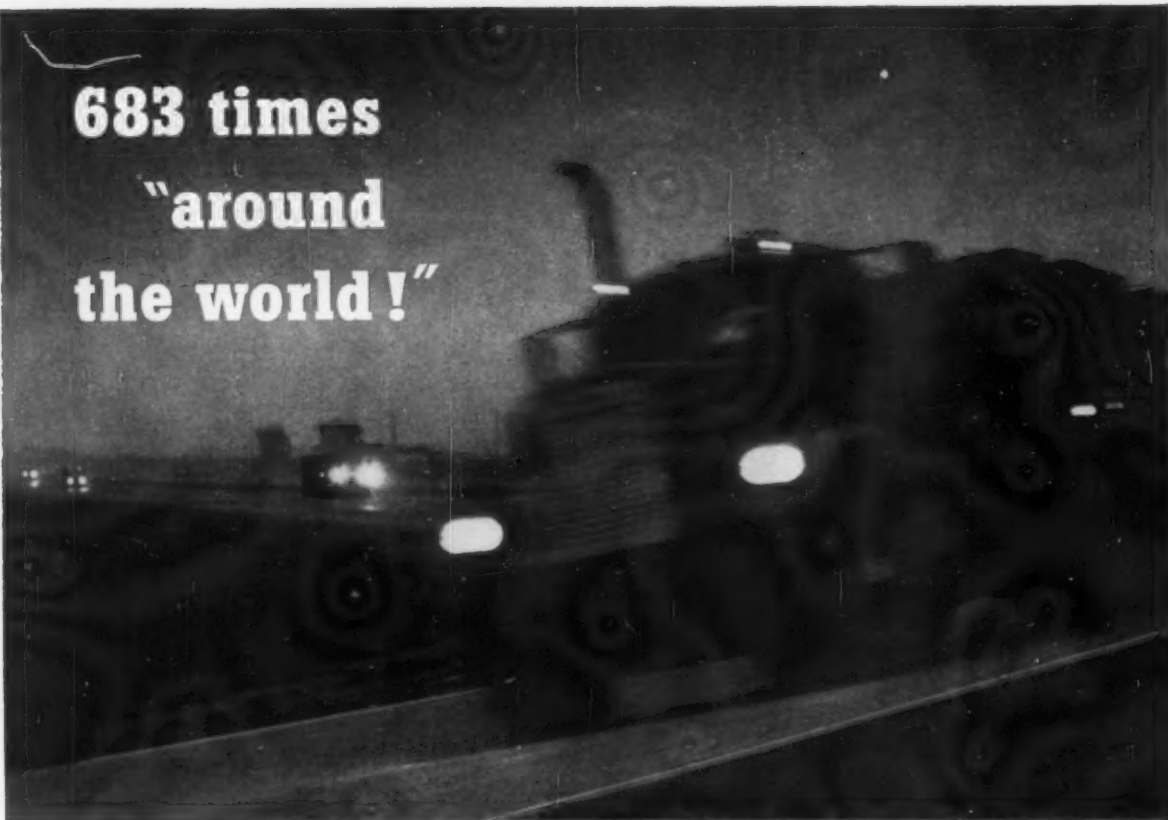
The wide load reminder served a number of useful purposes on this job where all sizes of truck beds

had to be filled and cleanup work done in close quarters.

Blasting Mats

A Duluth, Minnesota man is reportedly engaged in the unique business of manufacturing rubber blasting mats. O. B. Wasbotten, has worked up quite a business supplying mats to contractors and mine operators in the region. Pieces of old tires are punched and strung together on steel cables.

**683 times
"around
the world!"**



In closing months, 99 trucks ran night and day over five test loops to pile up 17 million miles

It's the great NATIONAL ROAD TEST!

November 30th, test traffic ended in \$27,000,000 pavement test sponsored by the American Association of State Highway Officials (AASHO).

More than 1,100,000 load applications and millions of scientific readings were recorded before the last truck rolled off the track near Ottawa, Illinois. The fleet of trucks included farm-size pickups to 54-ton semi-trailers.

On the test loops, 836 separate sections repeated nearly 200 different pavement combinations to provide a wide range of measurements.

Behind this pavement test are the most scientific methods ever used. Automatic electronic instrumentation and recording equipment assure unbiased, reliable findings.

Administered by the Highway Research Board
PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

of the National Academy of Sciences—National Research Council, the National Road Test will answer the big questions in today's highway construction. Engineers, officials and legislators will have invaluable help in designing pavements for the Interstate System—and all roads and streets.



Scientific readings by the millions have been analyzed by AASHO computers. "Statistically unassailable" facts on modern pavement design will result.

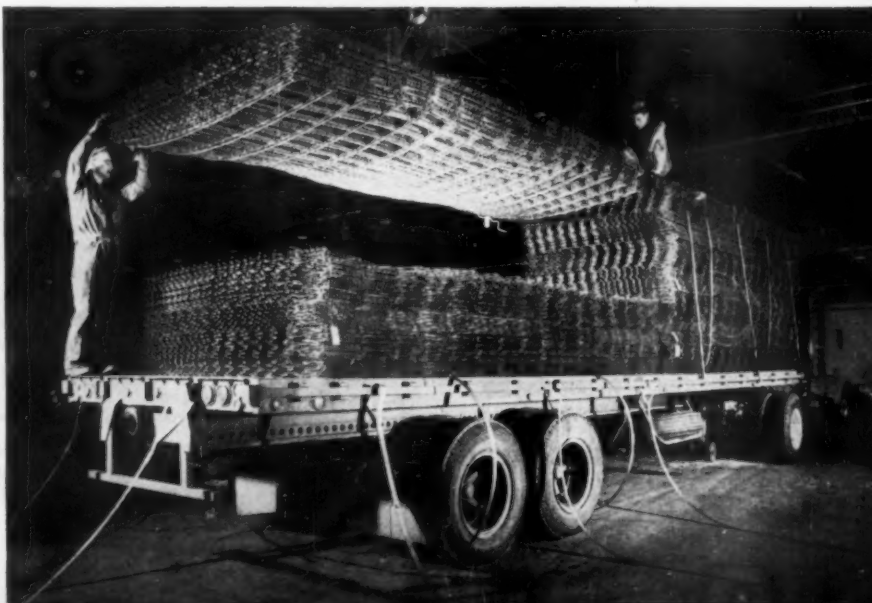
New Hinged Road Fabric from Pittsburgh Steel folds in slightly more than half the fabric's full width. Here in Glens Falls, N.Y., where Torrington Construction Co. of Connecticut is building a 14-mile strip of the \$275-million Northway, Job Superintendent Patrick J. DiNatale shows how new fabric folds along hinge running length of the sheet.



Pittsburgh Steel's New Hinged Road Fabric Big Success On New York State's Northway

Contractor Saves About One-Third Installation Time

Ready to go at Pittsburgh Steel's Monessen, Pa., plant is a flat-bed truck loaded with new Hinged Road Fabric. Ordinary road fabric requires special cradling equipment and extra handling. Not so with Pittsburgh Steel's new Hinged Road Fabric: it's shipped folded flat and in weights up to 40,000 pounds per truck (depending on size and style), twice that of ordinary fabric. Shipments to Glens Falls took only a day.



A revolutionary new road fabric from Pittsburgh Steel Company simplifies shipping, speeds handling and cuts installation time on roadbuilding jobs by as much as one third.

The new product, called Hinged Road Fabric, provides the steel backbone for a 14-mile strip of New York State's gigantic, \$275-million Northway linking Albany with Canada.

Hinged Road Fabric features an off-center hinge running lengthwise on each section. Roadbuilders using this product—one of several being introduced by Pittsburgh Steel—cite its built-in benefits during:

- **Shipping**—Because Hinged Road Fabric's novel hinge permits folding in slightly more than half the fabric's full width, it can be stacked easily within the eight-foot width limit of a truck bed or gondola. This makes special cradle trucks and cradling equipment unnecessary.

As a result, trucks can be loaded to capacity (subject to state weight restrictions)—up to twice the weight possible with ordinary fabric.

- **Handling**—A single section of Pittsburgh Steel Hinged Road Fabric can be handled easily by two men instead of the four usually required for unwieldy ordinary sheets.

- **Installing**—Because the sheet is not bent during shipping and stacking, new Hinged Road Fabric lies flat when installed.

At Glens Falls, N.Y., where 800 tons of Hinged Road Fabric were installed on the four-lane, 175-mile Northway, Torrington Construction Co.'s veteran roadbuilders added their stamp of approval.

Patrick J. DiNatale, the Connecticut firm's job superintendent, was especially enthusiastic about the one-day service on Hinged Road Fabric truck shipments from Pittsburgh Steel's Monessen, Pa., plant.

"We get terrific service from Pittsburgh Steel," said Mr. DiNatale. "It takes just one day for a shipment to get here."

"Ordinary fabric usually takes a week to ten days to arrive because it's handled by truck, rail and then truck again. That's because many counties and cities won't permit trucks with overhanging loads to pass through."

"Pittsburgh Steel's fabric is handled only once—and in one day in loads up to 40,000 pounds, not 20,000."

Torrington's field engineer, Robert B. Cunningham, is enthusiastic about Hinged Road Fabric's fast, easy handling. He said:

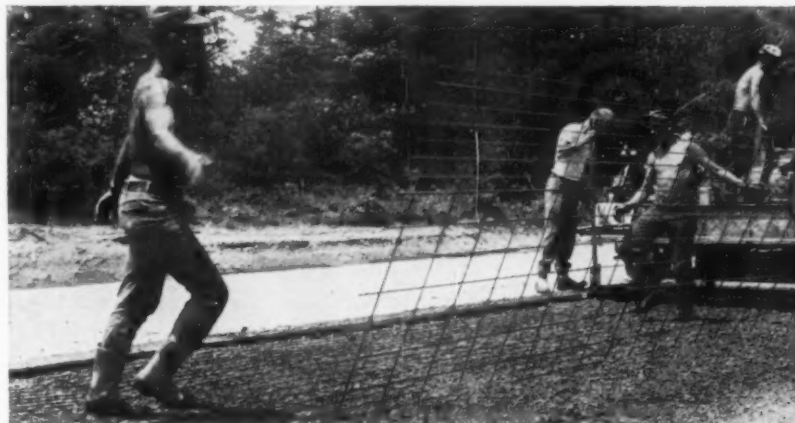
"I estimate that at the end of a working day this Pittsburgh Steel fabric saves us about one-third the installation time required with ordinary fabric."

The man directly in charge of the ... for more details circle 322 on enclosed return postal card

ROADS AND STREETS, January, 1961



On the job in Glens Falls, N.Y., a section of Hinged Road Fabric is handled easily and quickly by just two men.



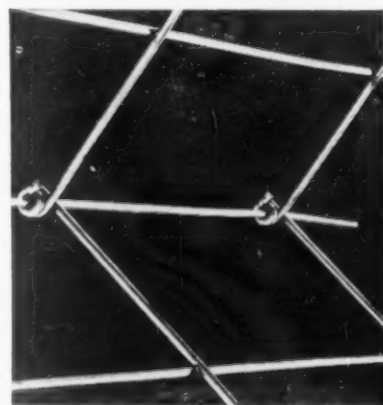
Down goes Hinged Road Fabric in just seconds—and as flat as a living room rug.

fabric's installation—Paving Foreman John Picciocca who has worked with all brands of road fabric for the last 12 years—had this to say:

"What really sold me on Hinged Road Fabric is that it doesn't poke through the concrete while it's taking a set. That's a big problem with ordinary fabric. When that happens, you either have to cut the wire or repave the spot to cover the wire. That's murder on costs."

If you're in the roadbuilding business, you'll be dollars ahead—like Torrington—when you let Hinged Road Fabric provide fast, economical reinforcement on your next job.

Contact your nearest Pittsburgh Steel Products sales office listed here.



Unique hinge is the result of two years' development work.

Hinged Road Fabric

Patents applied for

Pittsburgh Steel Products

a division of Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.



DISTRICT SALES OFFICES

Atlanta	Cleveland	Detroit	Los Angeles	Pittsburgh
Chicago	Dayton	Houston	New York	Tulsa
			Philadelphia	Warren, Ohio





Shown planning AED's 42nd Annual Meeting in Los Angeles this February are (l. to r.): Ben Sellers, Salina Tractor Co., Inc., Salina, Kans.; Al Hahn, Edward R. Bacon Co., San Francisco; R. J. Panke, Flesch-Miller Tractor Co., Indianapolis; Bill Bowman, AED Convention Manager;

Beal Shaw, Convention Committee Chairman, Shaw Sales and Service Co., Los Angeles; AED Senior Vice President, R. F. Newlin, Newlin Machinery Corp., Kansas City, Kans.; W. A. Patterson, Richards Equipment Co., Waco, Tex.; A. W. Ginther, Smith Booth Usher Co., Los Angeles, and O. R. Brogdon, Texas Tractor Co., Tyler, Tex.

AED Distributor Convention To Map Industry Course

What will 1961 bring to offset the spotty sales of the year just gone?

What will the Soaring Sixties have in store for construction equipment distributors and their manufacturer friends?

To seek answers, leaders of the Associated Equipment Distributors are dusting off their viewing glasses, as they pack suitcases this month to attend the 42nd annual AED convention. This big get-together, with over 3,000 delegates slated to attend, is set for Los Angeles, February 5-9. The distributor activities will center at the Statler-Hilton Hotel. The manufacturers will register at the convention's "second headquarters," the Biltmore. The nearby Mayflower and other area

hotels also will be spilling over with delegates and visitors from throughout the United States and Canada.

Contractors, too, will share in the program planned for this 5-day meeting. A panel of distinguished representatives of contracting, equipment distribution and manufacturing will analyze the things that went wrong in 1960 and try to chart a course for the construction and road machinery industry in the year ahead.

Keynoter will be AED president H. J. Mayer, of Western Machinery Company, San Francisco. He will take a hard look at business practices, as the lead-off in a program designed to stimulate the members to improve the industry's position

and their own in the highly competitive period ahead.

Among the spokesmen for manufacturers, John E. Carroll, president of American Hoist & Derrick Co., will contribute ideas on the role that both factory people and their dealers can play to improve business procedures.

The contractor's interest will be covered by such speakers as M. Clare Miller, president-elect of Associated General Contractors of America, who will review problems facing equipment buyers.

An Industry Roundtable session will again be a convention feature. A panel of distributor and manufacturer leaders will explore mutual-interest topics such as equipment financing, used equipment, warranties, etc.



Groves' four pavers. In distance, center, truck crane (flag on boom) is moving up to lift paving train units onto trailers for their overnight move.

O'HARE AIRPORT JOB

Continued from page 36

traction joints (50-ft. intervals) were not sawed but were preformed by a Sisalkraft joint former, a 3-in. vinyl plastic "V" envelope enclosing a "T" spreader strip. The envelope, tapering from $\frac{3}{8}$ in. down to $\frac{1}{8}$ in., was inserted into the fresh concrete under high frequency vibration. After the slab was set, the "T" strip was removed and the envelope collapsed and was taken out.

A relay of five tank trucks supplied water to the four pavers. Water received from a main at the terminal building was pumped directly to a 5,000-gal. overhead tank. The 2,500-gal. truck tanks were gravity-filled in five minutes.

Split-Second Batch Loading

The four-aggregate paving mix was air entrained with Darex agent and Daretard, a Dewey & Almy water retardant, was also used in the mix.

Heart of the paving operation was a Butler TX4 batch plant. This was a completely automatic setup designed for one-man operation. Groves' 4-batch trucks made straight-line stops at two stone bins, the sand bin and the cement station. All four truck compartments were filled simultaneously at each stop.

The plant operator sat at his control console on an

elevated platform 50 ft. offside from (and midway between) the sand and cement stops. He handled opening and closing of batch compartment gates and each time, in so doing, would activate the automatic weighing cycle. With the controls pre-set for the desired specifications, intake of the proper weight of aggregate into the four batch compartments took seven seconds.

Green and red lights at the batch compartments fluttered while the aggregate was being weighed. If the batch was over the weight limit, the green light stayed on; if under, it was the red light. On the occasions when this happened, the maintenance man climbed up to operate the gates manually and re-set to the desired weight. A tolerance of $1\frac{1}{2}$ percent was permitted in total batch weight.

The maintenance man at the batch plant, a mechanic experienced in electrical and electronic controls, served primarily in a preventive maintenance capacity. But he had to be on hand for immediate attention to burned-out tubes, switches, etc., which could dam up the flow of trucks.

The cement was trucked in from a railroad siding and carried by underground screw conveyor to the two 1,400-bbl. silos. Spotting of the control platform toward one end of the four-stop plant was dictated by the location of the cement. It was considered the wisest move to place the operator within easy view of



The opening for the plastic joint formers is made by vibration with this improvised rig which follows the last finisher.



After the concrete has set, the joint formers are removed and plastic strips laid over the joints to keep out dirt and moisture.



Bridge from which two workmen insert the joint formers and trowel them neatly in place.

the cement bin as this would be the more frequent source of delays.

In the paving of the runway extension, Groves employed an average of 24 trucks. The plant's output was about 2,500 batches, or 625 four-batch trucks a day. About 150 truck arrivals per day brought material from the Consumer Company plant in Crystal Lake, Illinois. Three 160-ft. Pioneer Engineering conveyor systems (30-in. belts) carried the material to the bins. Feeder bins were charged by Northwest 95 and Bucyrus-Erie 38-B cranes, the sand bin by a Hough Payloader with 2-yd. bucket.

William N. Chandler has served as project superintendent for S. J. Groves & Sons Co., with Jack Healy and Pete Kelly as paving superintendents and Ronald Barnes as project engineer for Groves. Carter Manny is project manager for Naess & Murphy at O'Hare, William Metschke director of engineer, and Lyle Thompson construction engineer.

Automatic Batching for Michigan

Automatic batching equipment is now required on all structure projects under the Michigan state highway department, where 500 cu. yd. or more of concrete is required for work other than paving. The provision adopted in May, 1960, requires the automatic feature for all projects advertised for bid after January 1, 1961. The provision applies also to proportioning plants used for transit-mixed or central-mixed concrete for this purpose.



For a better profit picture...

CHECK EUCLID C-6 WORK-ABILITY

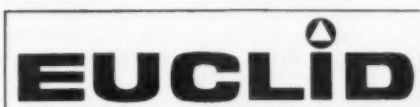


You'll find this new C-6 has the all-around tractor versatility needed for heavy construction, mine and quarry work. With five years of rugged field and proving ground test, this new crawler sets higher standards of performance on the toughest jobs for tractors in the 200 h.p. class.

Here are just a few advantages you get in the C-6... a dependable GM 6-71 engine delivering 211 net h.p. to the power train... a proven Torqmatic Drive that provides full-power shift and cuts cycle time... fast-as-a-fox maneuverability... almost unbelievable ease of handling... accessibility for servicing that pays off in more productive time on the job. It responds like nothing you've ever touched!

Have your Euclid dealer give you all the facts on the C-6... he'll show you why this new "Euc" belongs in your spread... why it's your best equipment investment.

EUCLID Division of General Motors • Cleveland 17, Ohio



FOR MOVING EARTH, ROCK, COAL AND ORE



"Now I can reach any of my drivers...anywhere ...anytime!"

YOUR BUSINESS, TOO, CAN PROFIT FROM MOTOROLA 2-WAY RADIO CONTROL

Here's how it cuts costs...

Your drivers are routed directly from job to job—no time wasted phone-hunting, parking and phoning in—no miles wasted backtracking or "deadheading". This is a proved fact: Your savings will more than pay for your Motorola system!

Here's how it builds sales...

Your drivers will make more calls per day—and you'll *get* new sales because Motorola dispatched service *makes* salesmen out of customers. You'll find it's *profitable* to say, "He's on his way," with Motorola 2-way radio.

See for yourself—Your Motorola man will show you a nearby system in action. He'll show you proof of Motorola efficiency and dependability. Call today. See your local Yellow Pages under "Radio Communications".



Motorola . . . the communications specialist to industry for nearly three decades

MOTOROLA 2-WAY RADIO

Motorola Communications & Electronics, Inc., 4501 Augusta Blvd., Chicago 51, Ill. • A Subsidiary of Motorola Inc. • SPaulding 2-6500

... for more details circle 318 on enclosed return postal card

Job Quality Problem Gets Combing Over at Detroit

Contractor's interest often touched on in program of the highway officials

Roads and Streets Staff Report

Highway officialdom's top brass put on old shoes and hard hats, figuratively speaking, while sitting in their chairs at several of the meeting sessions at Detroit. Project-level problems received more than ordinary treatment at this 46th annual convention of the American Association of State Highway Officials, held November 28 through December 2 in the Motor City.

The Joint Cooperative Committee of AASHO-AGC took up job problems. Various AASHO committee-sponsored sessions explored aspects of problems affecting contractors. These included prequalification; the tightened inspection and testing; progress in contract maintenance; and—a top feature of the week-long program—an all-afternoon panel discussion of construction quality management, with a contractor on the program.

And a dozen other meeting sessions focused on developments that will concern the contractor as time goes on. Among these were specifications, equipment advances, new materials or material requirements, traffic protection during construction—and refinements in highway technology all along the line.

This review will chiefly highlight the panel meeting on construction quality management. Sponsored by the AASHO's Committee on Construction, this brace of carefully prepared speakers took a broad approach, in that they encompassed not only actual construction control but also aspects of right-of-way taking, and other preliminary en-

gineering which affect the "quality" of the highway department's total performance. The session was headed by W. C. Williams, State Highway Engineer of Oregon, as chairman, and G. M. Williams, Assistant Commissioner of Public Roads, as co-chairman, with AASHO's retiring president Stevens of Maine as moderator.

The administrative problem of controlling construction quality was defined by D. H. Bray, State Highway Engineer of Kentucky. It is a twin one, he said, of providing trained personnel and of establishing checks and cross-checks of the workmanship, so that no incompetency or dishonesty will go undetected. This applies to all levels within the department. This speaker's discussion left job control details to others, his remarks being a report of a subcommittee on paving type determination.



AASHO's president-elect D. H. Bray, of Kentucky, snapped informally at the Detroit convention.

Channels of project supervision were outlined by Rex M. Whitton, Chief Engineer, Missouri State Highway Department. He traced the responsibility down from the top desk via the headquarters construction engineer, district office staff and field personnel.

The central construction staff's duties: Exercise overall control and guidance, and keep the State Highway Engineer informed. Promote uniform practices and procedures by issuing manuals, instructions, interpretations, rulings, other aids. Collect and review project reports, acting as the approving authority for plan changes, overruns and final payments for work and materials as submitted by the district engineers. Advise the districts on construction matters. Make supplementary periodic inspections of construction, independently checking the work of the districts on quality of work and materials, adequacy of inspection, project records, measurement and computation of quantities, and conformance with plans and specifications. Offer opportunity for consultation and advice to district engineers and other field personnel.

The district engineers (division engineers in some states), working through appropriate staff, should also have clearly defined responsibilities: Administer all construction activities, to see that work is done in accordance with department policy. Coordinate work of the resident (project) engineers. Keep in close touch with all projects to make sure work is done properly. Be responsible for promoting



More and better trained field testing personnel, as well as inspectors and project engineers, are needed according to M. Clare Miller, president-elect of AGC in speaking at the Detroit AASHTO meeting session.

uniform methods and a high degree of inspection. Make a complete audit of each final estimate, verifying all final pay quantities and examining all computations and records involved. Cross-check operations of the resident engineer, inspectors, checkers and survey parties for compliance with accepted practices and policies.

The project engineer in charge of the job also has definite authority and responsibility. Among other duties, he must see that all incoming materials have been tested and found to comply with specifications.

Mr. Whitton went on to outline the recommended channels of project supervision for rigid pavement jobs, as reported by D. C. Greer (Texas) of AASHTO's administrative practices committee. His concluding general comment: The need of the top echelon to support field inspection forces is a critical one. The field forces should be supported by giving them full consideration and hearings when specification changes are sought by the contractor. "It takes very few arbitrary cancellations of sound inspection controls to destroy the confidence and initiative of field inspection personnel."

Grading and minor construction quality control procedures were reviewed by W. C. Williams, of Oregon, chairman of a subcommittee on this subject. This speaker, too emphasized the need to double-check work performance all the way. While each state department

can adapt its detailed procedure to the organizational setup, Williams set down some basic requirements that apply generally to grading and small structure work.

A broader look at the control problem was taken by panelman Ellis L. Armstrong, Commissioner of Public Roads. In discussing the Bureau's Memorandum 20-5-60, issued last April, the commissioner said that "there is now good communication between the states and the BPR personnel. Variances in interpretation that have existed have been clarified . . . there is no evidence that anyone is shirking responsibilities, nor has anyone suggested a better method to secure the cross-check, necessary in highway administration as in any business or undertaking."

Some contractors have expressed concern, said the Commissioner, that the Bureau's new testing procedure would have an adverse effect on operations of the State and the Bureau personnel, and thus affect the contractor's operations. "There have been individual instances of misinterpretation and extreme caution and overzealous handling of technicalities in applying the Memorandum," said Armstrong, who added that the situation is improving.

The Memorandum does not impose new or stricter requirements on either the contractor or the state highway department, Armstrong emphasized. It does require additional check sampling and testing

of the materials and the completed work, and some additional certifications to document the record. "This effort has a good effect on construction operations, and is substantiating the public support of the highway program."

The contractor's interest was represented at the construction quality panel meeting by M. Clare Miller, president-elect of the Associated General Contractors of America. This Kansas road builder said that while he is convinced that 99 percent of highway contractors are dedicated to good construction, he speaks for the entire highway industry in endorsing quality control improvements that will help build public confidence. He listed examples of cooperative industry effort which are contributing to quality.

Miller asked that the highway officials, in adopting any new quality controls, guard against the possibility of imposing unnecessary limitations on the contractor's production. "Our costs as contractors," said Miller, "are completely governed by our respective abilities to produce. Therefore, any inspection procedure that might reduce production potentials will inevitably result in higher costs . . . the tail will be wagging the dog if production is reduced to fit inspection procedures, rather than testing expedited to fit production."

Miller also asked that the contractors be given plenty of advance

notice on all quality management procedure adjustments. "We contractors are creatures of habit, and our cost estimates are almost universally predicated on past experience. Any procedure adjustments that could effect cost would be most disastrous in a market where the contingency factor is the exception rather than the rule."

"You wouldn't consider writing the specifications subsequent to the contract award. The same should apply to procedure changes."

Miller was forthright in observing to the AASHO delegates present that "in our carefully considered judgment," a line of communication vastly superior to that presently existing will be needed in upgrading quality control management in the state highway departments. Those who write the organization rules know the reasons and the results expected, he said, but the field personnel charged with enforcement are not as understanding of the end-results required.

Closer job control management, said Miller, will require vastly expanded supplemental specifications. While it isn't practical to rewrite the "Book" for each job, it is equally impractical not to take advantage of past experience and local conditions. Heretofore this has been done chiefly through verbal commitments and cooperative understandings between the engineer and the contractor. Now that job performance is being evaluated more closely, by those trained in strictest interpretation of the written word, a complete set of written rules is needed for each performance.

Speaking of tolerances of accuracy in the finished work, Miller suggested that for massive high-speed equipment, weight be used as a basis of compensation whenever possible. Tolerances should be the maximum that will still result in both quality and economy. "Fully realizing the necessity for minimums, we suggest that mandatory tolerances be created in the direction of permissive maximums."

Miller, in closing, suggested that contractors be evaluated on their performance ability, beyond the prequalification requirement. Many jobs he said have been awarded to firms which have not shown ability to successfully construct the type of project taken.

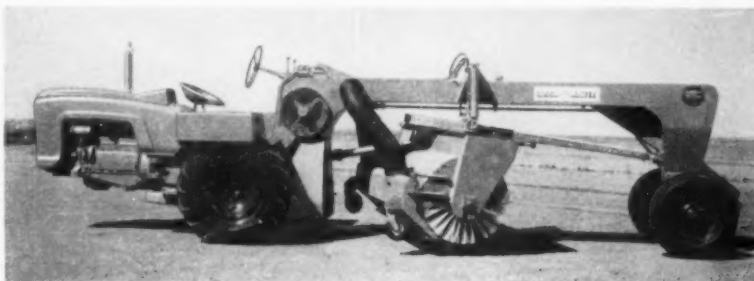
CLEAN, DUST-FREE SURFACES LIKE THIS MEAN BETTER SEAL COATING



... yours with FLAHERTY BROOM-MASTER

Here's what one contractor recently said about Broom-Master — "We used it to prepare runways on a large airport job. The blower feature provides clean, dust-free surface good seal coat work demands, and I was particularly impressed with the broom's ability to move excessive chips that accumulate to the side of the machine. Broom-Master is well-balanced, fast and maneuverable — something construction has needed for a long time."

And on this job the machine showed only 1/4" of broom wear after 36 hours of constant use. Here's why Broom-Master is the efficient, low-cost answer to cleaner surfaces:



■ **Positive broom setting**— insures minimum core wear — tips of bristles do all the work.

■ **Ampli-Torc drive** — provides choice of 12 working speeds.

■ **Built-in blower**— applies broom width jet air stream at proper place, assures efficient clean sweep.

■ **240 Gallon water tank**— an integral part of machine frame.

See your Flaherty distributor or write for bulletin.



Flaherty Manufacturing, Inc. Branch
Buffalo-Springfield Co.
Pocatello, Idaho

A Division of
KOEHRING
Company
F3

Rate Contractors More On Job Performance AASHO Delegates Told

A financial rating is essential, but be sure to place enough emphasis on a contractor's job attitudes and ability to do good work. This is one of the conclusions from New Jersey's 30-year experience with prequalification for state highway work. Speaking at the Detroit convention of the American Association of State Highway Officials, O. H. Fritzsche, state highway engineer of New Jersey, inferred that contractors who drag their feet in job compliance represent a problem yet to be completely licked in the state's prequalification procedure.

In New Jersey according to this speaker, a statute in force since 1931 requires sworn statements from bidders as to their financial ability, adequacy of equipment, organization and past performance. This law permits the state department to establish reasonable regulations. Little change has been made, except that since 1954 several new higher rating categories have been added, with "Unlimited" now meaning above \$6 million.

Subcontractors in New Jersey are required to prequalify if their work load on state road jobs exceeds \$25,000. Many firms fully qualified have been taking only subcontract work, these firms averaging about five per prime contract.

Mr. Fritzsche's conclusions, and recommendation's from his state's experience:

1. Prequalify the contractor before bidding. This is not only to protect the taxpayer's investment, but also to assure project inspectors that there is some experience and reliability behind the successful bidder.

2. Rate him on a Confidential Past Performance Report by the project engineer at the conclusion of each project. Too little emphasis is now placed on this phase, compared with dollar assets.

3. Evaluate the contractor's equipment on a "have" or "have-not" basis modified by a use factor. If he has the equipment necessary, but from past experience does not employ enough of it on his state road jobs, his equipment rating should be lowered.

4. The excess of the applicant's liquid assets over his current liabilities is a key rating factor. It shows the money he will have available to buy materials and pay his employees. "This is the figure that we must start with before applying factors developed because of size, type of work or experience," said Fritzsche.

"Yet while this phase according to all prequalification plans should perhaps have been listed first, I purposely have placed it last. It seems that all methods of prequalification place too much stress on financial responsibility and too little on *how efficiently the contractor performs his work.*"

To the man on the job and to state, this speaker continued, it makes little difference that a contractor has unlimited cash resources, if during the course of a project continual conflict occurs, or twice the inspection force is required to obtain a respectable product.

Fritzsche cited an example of such a "bad actor." Only recently a contractor with assets in the \$2,000,000 class ignored instructions on a \$500,000 project. His work force on this job ranged from 8 down to none. He tore up adjacent front lawns with no effort to quickly shape them up. And he was only 53 percent completed when scheduled at 100 percent.

Yet this fellow successfully bid another million-dollar state highway job. "Through a technicality," Fritzsche said, "the project was awarded to the second bidder. We believe this to have been done in the public interest. Yet no state

officials should be placed in the position of possible criticism when his actions are motivated by nothing more than the public's interest.

"We in New Jersey have not solved this 'fly in the ointment' of prequalification," this speaker said in conclusion. "We have discussed a plan of separating financial from operational responsibility, with an idea of refusing prequalification if the applicant falls below a certain percentage on the operational side. To put such a plan into effect will require much investigation, however, both from a legal and a practical viewpoint.

STATE HIGHWAY AWARDS

Continued from page 65

\$140 million in jobs for contractors in 1961. This state too piled work on its hungry contractors in the last weeks, including a \$20.2 million letting, largest ever.

New York's three-year sequence—\$228 vs. \$292 vs. \$300 million—is another example of the come-back in awards from 1959 through the year just beginning. A December 9 letting at Albany brought \$49 million in low bids—a new record for a single letting.

Indiana more than doubled its award pace, from \$44.0 million in 1959 to \$96.2 million in calendar 1960. Virginia also doubled from \$41.9 million to \$93.8 million and will keep on climbing this year to a planned \$120 million in awards. New Mexico has a similar picture, percentage-wise. A dozen or more other states tallied hefty award gains in 1960, as a run-down of the table will show.

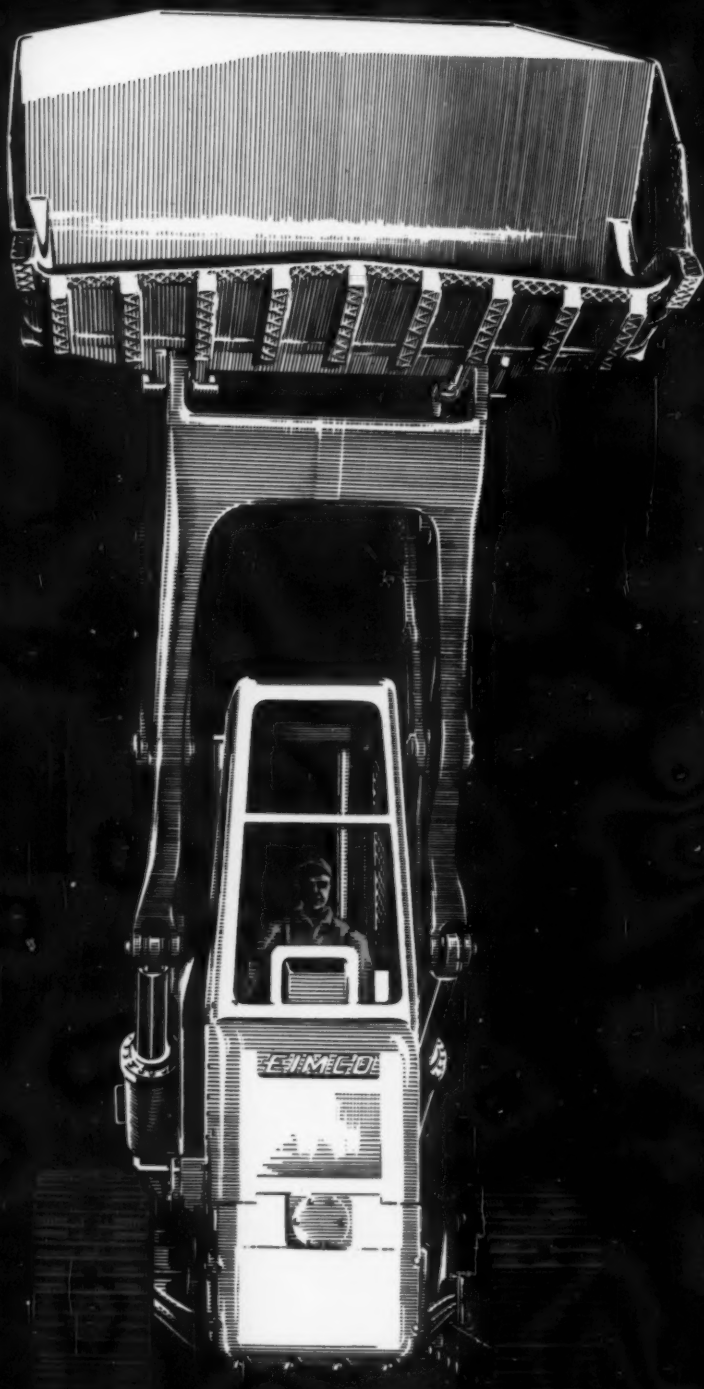
Connecticut, while awarding only \$25.8 million in jobs in 1960 compared with \$53.3 the year before, will jump back this year with a \$68 million letting schedule in the wind.

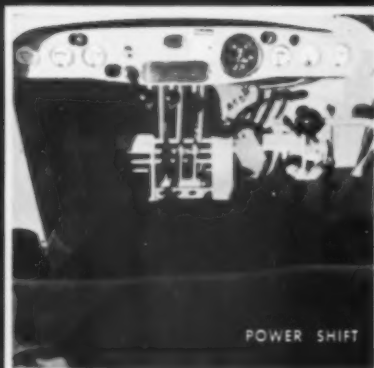
Delaware represents an extreme example of fluctuation, with a virtual cessation of state road awards for 1960 due to—guess what—running out of state funds. It will make up for lost time in 1961 however, with \$17.5 million in jobs being readied for the year.

Massachusetts fell spectacularly short—instead of a \$92 million second half in 1960, it awarded only \$47.9 million and ended the year with \$63 million instead of

103
105
106

YOU'RE YEARS
AHEAD WITH AN
EIMCO!





Power Shift

Eimco's patented, unique "Unidrive" transmission lets you shift from one speed to another, forward or reverse, at any engine or tractor speed or load. Features gears that never reverse rotation! Heavy duty single stage torque converter standard equipment.

Independent Track Operation

Eimco's patented Dual Final Drives give you "flip-of-the-lever" control over each individual track for true spin, as well as normal brake, turns.

Full Track Oscillation

Eimco's patented alloy-steel equalizer bar permits full track oscillation, even with attachments, for greater stability and safety.

True Cockpit Visibility

Eimco's exclusive up-front operator position means the operator can see his work as he approaches it for greater control, safety and work output with no stretch, squint, squirm . . . less operator fatigue.

Anti-Friction Bearings

In every track roller and idler . . . each bearing in separate cage to maintain accuracy, longer life, and ease of maintenance.

Power Take-Off

Standard SAE specifications for take-off and drilling. Shaft runs continuously and is not affected by track operation.

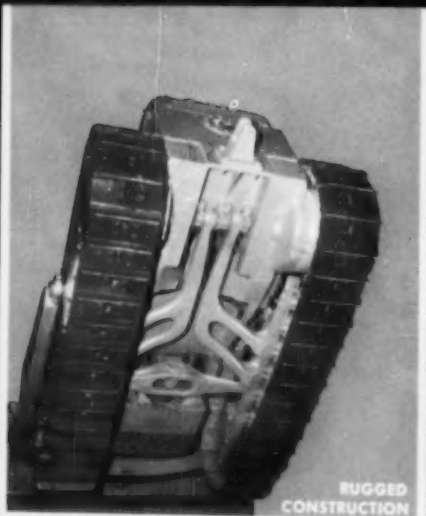
EIMCO CRAWLER WHAT OTHERS

AN OPERATING RECORD OF

A Full One-year Warranty Against Any Defects in Workmanship and Material on every Eimco Tractor, Tractor Unit and Transmission!

Tractors • Dozers • Excavators
Front End Loaders • Log Loaders

Special Steel Mill Excavators
and Front End Loaders



**RUGGED
CONSTRUCTION**



105 EXCAVATOR



103 DOZER



115 STEEL MILL EXCAVATOR



146 LOG LOADER



TRACTORS GIVE YOU TODAY CAN ONLY PROMISE FOR TOMORROW

70% SAVINGS IN MAINTENANCE COSTS!

Step Up Your Work Output . . . and Profit . . . with the modern, efficient

EIMCO 103
100 H.P.
DIESEL

EIMCO 105
142 H.P.
DIESEL

EIMCO 106
208 H.P.
DIESEL

"ADVANCED ENGINEERING AND QUALITY CRAFTSMANSHIP SINCE 1896"

THE EIMCO CORPORATION



**TRACTOR LOADER
DIVISION**

EXPORT OFFICE: 81 - 82 SOUTH STREET, NEW YORK, N. Y.
BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

E-517

434 SOUTH 4TH WEST
SALT LAKE CITY, UTAH - U.S.A.



Now...one coat of enamel combines rust inhibition, durability and color retention

*For the first time these three factors can be provided in one paint containing **M50**® pigment.*

Here's news of a new type of enamel that greatly simplifies the painting of highway signs.

With these new enamels, *one coat* is all that is needed. This single coat combines . . . for the first time . . . more rust inhibition than ordinary primers with even greater durability and "color fastness" than most finish paints. What's more, except for white, these enamels can be made up in all the colors normally used in highway sign painting.

A unique new pigment . . .

M50® basic lead silico chromate . . . gives the one-coat enamels their exceptional properties. In this pigment, one of the most effective of all rust inhibitors, basic lead chromate, is solidly fused to an inert core. In metal protective paints, exposure tests have proved that this pigment maintains high rust inhibiting activity for years and substantially retards color fading.

Greatly inhibits under-the-film rust creepage, as well

As you have probably noticed, when ordinary enamels are nicked or damaged in service, the rust that starts spreads under the paint in no time. As this rust creepage continues, paint flakes off to open the way for further corrosion. The new **M50** one-coat enamels greatly reduce such premature destruction of the paint film . . . help keep sign repainting needs down.

Before you order paint again . . .

Look into these unusual new enamels. They can be made up by your regular suppliers in standard colors.

M50® an **oncor**® Pigment . . . A Development of

National Lead Company
General Offices: 111 Broadway, New York 6, N. Y.

. . . for more details circle 319 on enclosed return postal card

the \$117 million estimate given to Roads and Streets in September. Again, the legislature is blamed.

Several other states, the tabulation shows, have a less happy outlook for their road contractors. Among the states which were down in 1960 and will also remain at a level below 1959 or 1960 are Florida, North Carolina, Texas and Vermont, to give an incomplete list.

The third and fourth quarter award estimates made for Roads and Streets by the highway departments in Sept., 1960, turned out to be fairly accurate in most instances. Several other states however, such as Florida and Idaho, didn't get all of the jobs on the contractor's books that they intended—due to a multiplicity of reasons. Some states (i.e., California, Mississippi) came out ahead of their earlier estimates.

The state highway construction job award picture, to sum up, is revealed to have risen sharply during the 1960 calendar year, chiefly during the second half, as a result of loosening of funds under the contract controls program and of making fiscal allocations available to the states well in advance. As a result of this fund-availability, and of the variable ability of the respective state departments to match funds and have plans ready, the awards will continue at a relatively high level through 1961.

After that?

This is indeed the big question. The industry's eyes will be on the national Congress and the state legislatures, most of which are meeting in 1961.

Michigan Plans Heavier Freeway Shoulders

The thickness of shoulders on Michigan's freeways will be doubled under new specifications adopted by the Michigan state highway department. Shoulders on all new freeways, as well as some already open to traffic, will be paved 1¾ in. thick with asphalt.

Under the old specifications, shoulders were given a double surface treatment using liquid asphalt and stone chips, totaling about ¾ in. thickness. One announced purpose of the new design is to reduce maintenance.

Hook an OWEN Clamshell Bucket to your crane and you're sure of superior performance and longer life. For OWEN Buckets have exclusive super-efficiency and long-lived features you won't find in ordinary clamshells.

For instance:

- Block and tackle type reeving
- One-piece head construction
- Recessed lips
- Single main shaft
- Riveted bowl assembly

For over half a century OWEN has been building clamshell buckets—tailored to meet the requirements of "men who move the earth the world over".

So team your crane to the bucket with the BIG BITE that's JUST RIGHT for every job!

Write today
for the money-saving
facts and figures.

THE BIG BITE

THAT'S JUST RIGHT!



OWEN

BUCKET COMPANY

BREAKWATER AVENUE • CLEVELAND 2, OHIO

BRANCH OFFICES: New York • Philadelphia • Chicago • Berkeley, California • Fort Lauderdale, Florida

... for more details circle 321 on enclosed return postal card

Bituminous Roads And Streets

Bituminous features appear
between pages 100 through 113

Views and Comments

By H. G. Nevitt

Multilayered Road Structures

Everyone keeping in touch with highway developments must have noted the increasing use of numerous layers of different characteristics in modern highway projects, particularly those of considerable size. The old timer, used to a pavement (mat) layer, a base course, and perhaps a sub-base, finds that each of these components may have been replaced by a complex of layers. Obviously the subject is of interest. This multilayered construction offers advantages, but it also offers some possibilities of trouble. We will, in this and succeeding discussions, attempt to briefly bring out some of the points of importance in this development.

There are sound reasons for the use of succeeding layers of different properties from both the functional—that is, technical—and economic standpoints. The layer properties can change with increasing depth; and economy in the construction usually indicates they should, although the cost picture is not always as simple as it sometimes appears. We plan to devote later discussions to a more detailed consideration of these factors. However, there are some other considerations, of a general nature, which must also be kept in mind. We wish to first point these out.

The use of numerous layers of varying construction adds to the complexity of the work, which may

jeopardize both its cost and its ultimate quality. For this reason we believe a note of caution should be injected into this trend, which shows some signs of becoming fashionable rather than adopted solely for its merits.

One argument is that on projects of sufficient size the quantities are such that minimum unit costs are achieved on each layer and there would be no benefit from this standpoint by fewer but thicker courses, hence many layers cost no more. The fact is that complexity is likely to breed confusion. The possibilities for poor construction practices, errors and deficiencies in design and inspection creeping in, are amplified in proportion to the number of types of layers used. For this reason alone we doubt the desirability of too many different layers unless clear cut benefits of appreciable magnitude can be shown to result.

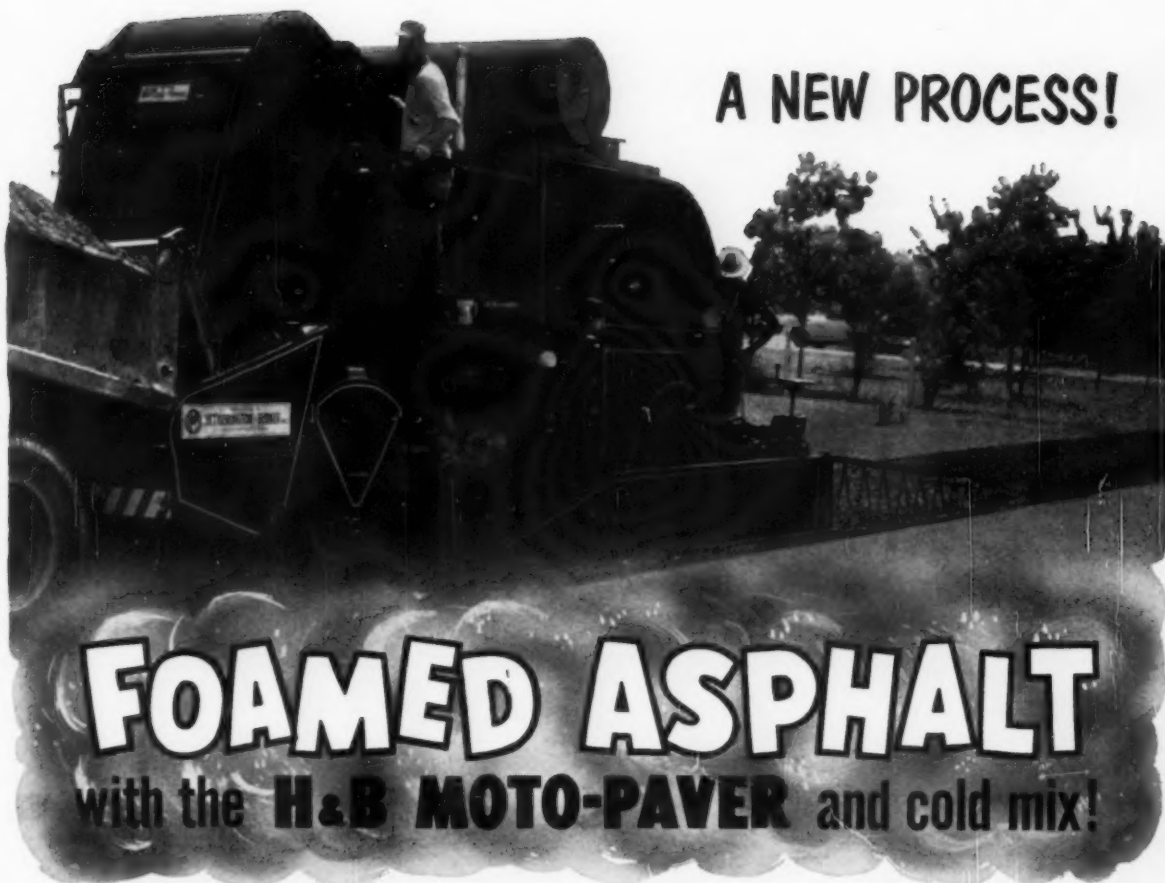
This point is best brought out by work in areas where the entire project—design as well as construction—is bid on rather than merely the construction of a specified design. Here we have an extension, so to speak, of the free enterprise competitive principle with its benefits to the planning and design phase. The successful bidder almost invariably gets the job on the basis of a simple, easily built, therefore economical design. We aided a contractor on such a project some

years ago; and the resulting construction was far simpler, likewise cheaper and quicker to build, than others arrived at by more conventional approaches.

The next point is that the benefits claimed for each layer in such systems must actually exist in that particular project. Lack of this is often brought out in black base construction. Black bases correctly designed offer many advantages for modern traffic conditions; and their use is expanding at an astronomical rate. Yet we have seen base courses so designed that the asphalt used did no good whatever, or perhaps even depreciated the quality of the base.

Then we have also seen base courses used whose properties would have been greatly improved by the addition of asphalt. Obviously in each case proper consideration was not given to the functional needs of the layer, and what was required to meet them in the best fashion possible. The selection of each layer in the system, and particularly any basic variation in its properties or method of construction, should be a matter of careful engineering and economic consideration—rather than based on so-called standardized construction or blindly adopting a design successfully used elsewhere.

Multi-layer construction inherently has possibilities of many advantages. These will increase as traffic effects become more intensive—particularly so where our highway agencies give recognition (as is being done in some other countries) to the benefits to the overall economy, with due allowance made for the increased road costs involved, from the use of heavier, and perhaps wider and longer, transports than are now generally permitted in the United States. However as with nearly all good things, these possibilities must be correctly appraised and achieved. We will attempt to detail the needs in our later discussions. Meanwhile we can conclude with the statement that the use of numerous variable layers is a tool for betterment, but one which should be used with great care, if our objective of more transportation for the money available is to be realized.



A NEW PROCESS!

FOAMED ASPHALT

with the **H&B MOTO-PAVER** and cold mix!

HERE'S HOW!



Asphalt, prior to being combined with aggregate, is reduced to a foam through the action of steam via a special jet-type nozzle. The foamed asphalt evenly distributes throughout the mix. As it is rolled, the foam dissipates and the asphalt reverts to its natural state. Benefits and advantages are many. For example . . .

NO WAITING FOR CURING

Compaction by rolling immediately after spreading.

ASK FOR DETAILS about this NEW OPTIONAL FEATURE ON MOTO-PAVER, H&B's combination Traveling Mixer and Paver.

TOWER TYPE BATCH PLANTS in 8 sizes

MOBILE TYPE BATCH PLANTS in 6 sizes

BASE STABILIZER PLANTS in 2 sizes

MOTO-PAVER, the travelling combination Mixer and Paver (cold mix)

Cable Address: Panmakina

HETHERINGTON & BERNER INC.

A Wholly Owned Subsidiary of American Hoist & Derrick Company
Engineers

Manufacturers

701 KENTUCKY AVE. • INDIANAPOLIS 7, IND.
Export Dept.: 205 W. Wacker Drive, Chicago, Illinois



Laying the one-half-inch thick open-graded carpet, as the final component of a 7-inch asphaltic pavement, US 91-466 in the California desert.

380,000 Ton Asphalt Job For A Desert Freeway

Steady production with single 8,000 pound plant keeps record-sized project on schedule

North of Baker in the southern California desert a freeway project is under construction that sets an asphalt tonnage record. It exemplifies California design for arterial traffic with economic use of available materials. And its progress has spotlighted the problem of placing base layers under today's exacting specifications despite pit variations.

The \$5 million package contract was awarded in April of 1960 to the combine, Gordon H. Ball, Gordon H. Ball, Inc., Ball & Simpson, E. L. Yeager Co., and E. L. Yeager Construction Co., Inc., of Danville and Riverside, California. The Ball organization took on the grading, drainage and structures and Yeager the subbase, base and paving. The job which will run well into 1961 will convert the present two-lane U.S. 91-466 on the Los Angeles to Las Vegas run into a four-lane divided leg of Interstate 15 freeway. The contract takes in 26.2 miles of new south-bound two-lane roadway and improvements and resurfacing of the existing roadway, which will convert to north-bound.

Separate reports will discuss the grading with its long hauls and huge water gallonages, and the small bridges which are concrete prefab. This review is confined to the base materials and asphaltic concrete paving, which started late in the 1960 summer. An idea of the paving production task is gained

by a look at the chief quantities: 44,000 tons of aggregate subbase, 352,000 tons of aggregate base, 386,000 tons of asphaltic concrete.

The Yeagers are getting their subbase and base aggregates from several wayside material sites. For the asphaltic concrete a large crushing plant and hot-mix plant are supplying the job from two setups. While maintaining near record speed, the company has shown prime concern for holding a steady production, dovetailed closely with the grading and structure work.

Pace setter is the asphalt plant which has maintained 3,000 to 3,500 tons daily production. This is a Standard Steel Corporation Model RM plant with 8,000-lb. pugmill, semi-automatic pushbutton controlled. Components include Hardy scales, a super-lift dryer 8'x36' with Model SM 751 low-pressure burner, and Standard's new cyclonic wet washer dust collector. The three 12,000-gal asphalt storage tanks were kept at temperature by a Childers DO150 hot oil heater. Three Caterpillar diesel generator sets (two new 200-kw Model 353's and a 50-kw Model 387) power all plant components.

The hot-mix plant's cold elevator is fed directly from a tunnel belt under the four stockpiles. The crushing and screening plant, as set up in location No. 1 (north end) is here pictured along with

the asphalt plant at this location.

At this point let us look at the multi-layer structural section adopted for this job. It comprises a subbase ranging from 0.5 ft. where basement material is relatively poor, to no subbase where basement with good structural features exists. Following, in order, is 0.67 ft. of aggregate base and 0.58 ft. (7 in.) of asphalt concrete. Some of the pertinent details of each component:

1. Subbase. The subbase is constructed of California Class 2AS aggregate, a 2½-in. maximum gradation designed for good structural characteristics and low capillarity. Sand and gravel have been generally found in conjunction with most of the material sites adjacent to the construction area and were proved suitable for subbase use. It is hauled to location with bottom and end dumps, sized through a Jersey spreader on a D8 Caterpillar and then compacted with rubber-tired rollers to 95 percent as determined by California test 216.

2. Aggregate Base. California Class 3AB material is required. This is a 1½-in. maximum sand-gravel, screened as necessary for gradation, with fines limited to 3 to 12 percent passing 200 mesh. Like the subbase, this material must meet tests for abrasion loss, resistance (California R value) and sand equivalent.

Continued on page 107

PAVES QUALITY MAT AT 140 FPM, ELIMINATES SECOND FINISHER

Big Barber-Greene finishers on tracks and rubber acclaimed paving pacemakers by owners in South Carolina, West Virginia

Two new high-capacity Barber-Greene finishers—the SA-60 crawler-mounted machine and the pneumatic SB-60 model—are proving with unmatched high capacity high quality production that they deserve the title of paving pacemakers.

E. G. Shuler, General Superintendent for J. F. Cleckley & Co., Orangeburg, S. C., reports on the crawler-mounted SA-60 model:

"Our big SA-60 really cuts the mustard for us putting down high quality mat at 140 fpm for as long as we can keep trucks out in front. We averaged 90 fpm on one 11' paving job where we had binder courses of 1" and 2" and a 1" top course. We intended when we bought this model to eliminate a second finisher on our jobs, and the SA-60 does just that.

"We've owned Barber-Greene finishers since we started in the hot mix business back in 1950, but we've never had a machine that could handle the tonnage this model does. We've already put 65,000 tons through the machine this season with no maintenance problems. And our operators love it."

Pneumatic Model SB-60 praised

Acme Construction Co., Beckley, W. Va., prefers the same machine mounted on rubber tires—the

SB-60—for these reasons:

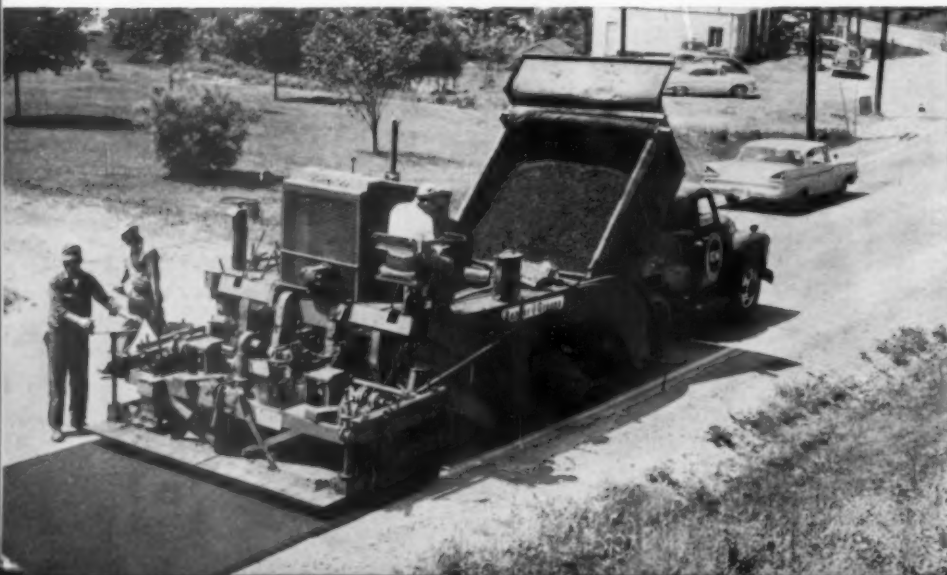
Supt., J. B. Bibb, "Our SB-60 Barber-Greene gives us higher laying and travel speed than we've ever gotten with any paver. It lays a level mat on the most adverse base conditions.

"Long runbacks used to mean shutting down our plant for as much as 30 minutes—but not since the SB-60 came on the scene. The SB-60 travels back at speeds to 15 mph, so the plant keeps running and there's no build-up of trucks."

13 fast width changes

E. L. Spencer, operating foreman, adds, "On our present job, we hit 13 mat width changes in 1,500 lineal feet. The ease with which we can cut-off or extend normal laying width with the SB-60 is a big time saver. Also, the big power, traction, oscillating truck push-rollers and power steering lets us breeze through this job over hilly terrain with steep grades and almost continual turns. We're 100% satisfied."

Get full facts on both models from your Barber-Greene Distributor. Either the SA-60 or SB-60 will give you highest capacity performance and make the most of your plant, your truck fleet, and your manpower.



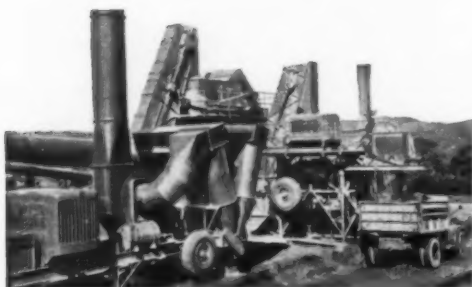
RUBBER-TIRED SB-60 BARBER-GREENE FINISHER is seen resurfacing U.S. 60 for Acme Construction Co., Beckley, W. Va. High capacity paver easily made 13 width changes on a 1,500' stretch of this job. Fast runbacks—15 mph—eliminated 30 minute plant shutdowns previously experienced.

These new rubber-tired and crawler-mounted high capacity Barber-Greene's deliver unmatched asphalt paving performance through new operating features never before available on any asphalt finisher. Write for your copy of new 24-page catalog.



SA-60 CRAWLER-MOUNTED BARBER-GREENE FINISHER paves at 140 fpm for J. F. Cleckley & Co., Orangeburg, S. C. On 40,000-ton resurfacing job on U.S. 23 and U.S. 25 in

South Carolina, foreman and operator called it "easiest handling finisher to come down the pike."



Choose from Barber-Greene's largest selection of continuous and batch-type mix plants to complete the most profitable paving package available.

World's No. 1 Manufacturer of Asphalt Paving Equipment

Representatives in Principal Cities of the World

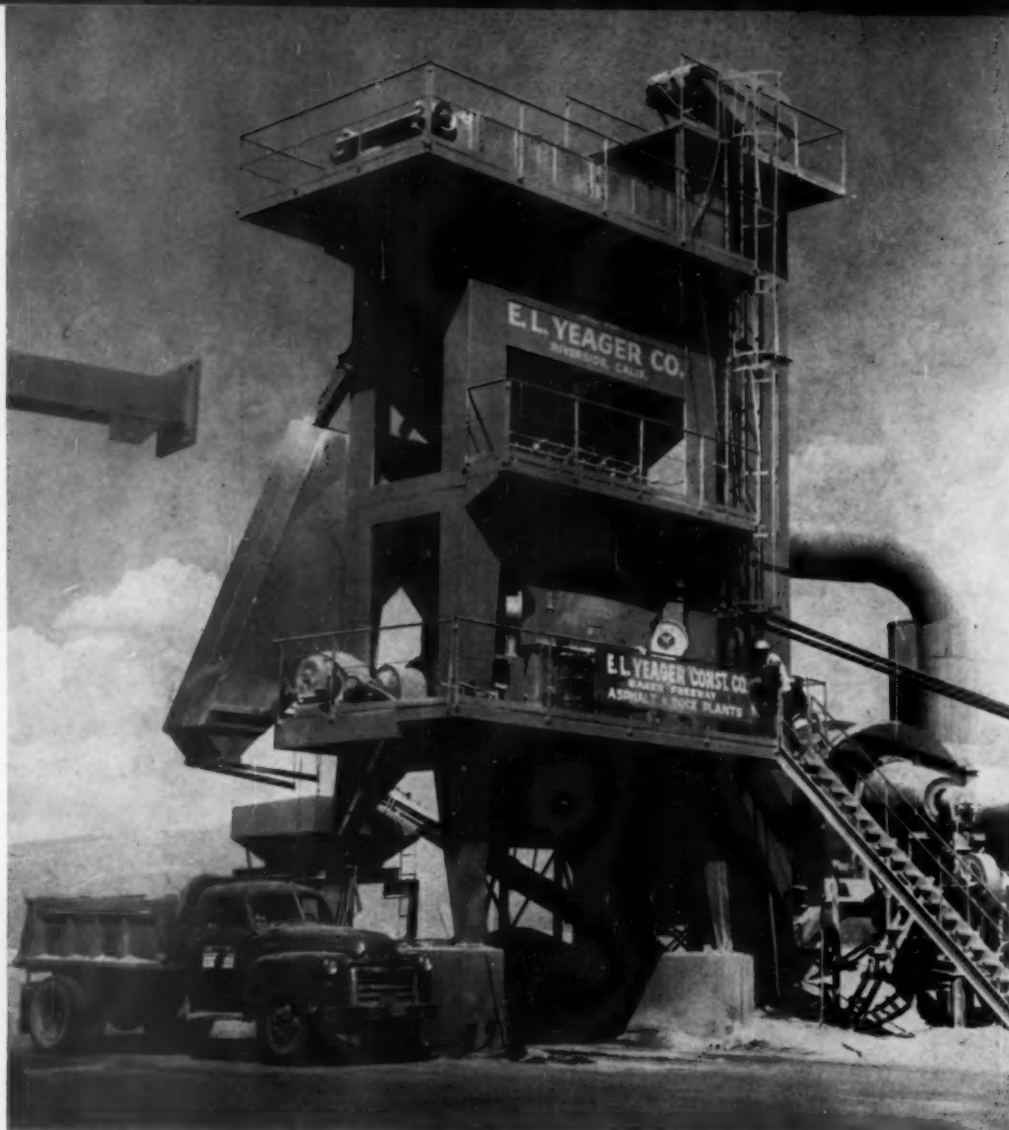
Barber-Greene

Main Office and Plant: **AURORA, ILLINOIS, U. S. A.**
Plants in DeKalb, Illinois, Detroit, Canada, England, Brazil, Australia



CONVEYORS • LOADERS • DITCHERS • ASPHALT PAVING EQUIPMENT

... for more details circle 281 on enclosed return postal card



Standard Steel Corporation asphalt plant which is handling the record-tonnage desert highway job.

(Left): At the automatic controls of the 8,000-pound plant. (Center and right): Three 12,000-gallon tanks for the 85-100 penetration asphalt are controlled by a Childers D-150 hot oil heater.





Caterpillar diesel-electric generators which powered the big asphalt plant's components.

380,000 TON JOB

Continued from page 103

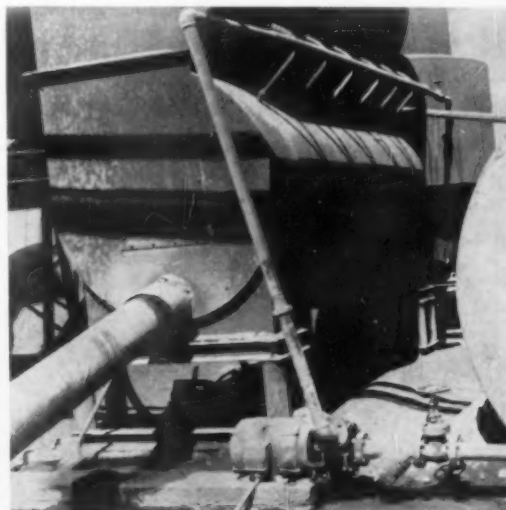
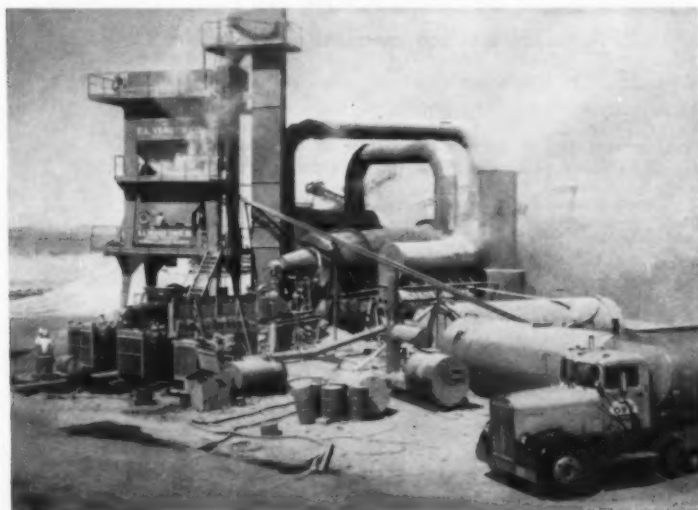
The 8-in. base is put down in two equal lifts using Jersey spreaders. The spread drop must be accurate within 5 percent, to minimize need for any manipulation that might cause segregation. As with the subbase, base specifications spell out in considerable detail the requirement of securing uniform, even layers, free from segregation, ridges or other defects, that might affect durability and surface evenness of the finished highway.

Compaction to 95 percent is obtained with three-wheel steel rollers. Moisture has been controlled, despite the hot, arid desert conditions, with relative ease by using large water trucks on the spread. The completed base has a tolerance of .05 ft. of plan thickness. After its final trim with a motor grader and final rolling, it is prime coated with liquid asphalt to hold moisture and protect against scuffing during paving operations.

Base construction has been attended by its share of problems in

gradation control from the variable alluvial pits. In some cases oversize has had to be bypassed or scalped. More frequently the problem has been to screen out excess fines, or to blend material to make up for a deficiency in coarser material. The inspectors have depended heavily on frequent spot checks on the spread while waiting for confirming tests. The contractor's men in turn were on the lookout for excess fines and other faulty gradation and manipulate pit loading to secure a good blend.

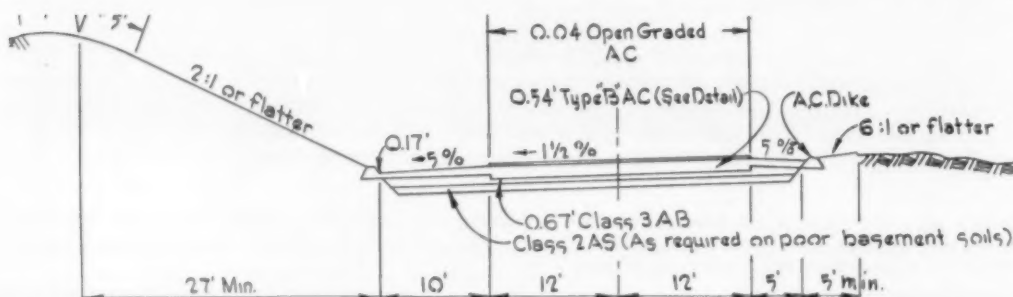
(Left): The plant seen on a day when it was dust-covered from delivering a special order of dried and graded aggregates, required by California state maintenance forces for area use. (Right): Part of the dust collector system, required for this remote location chiefly to salvage fines and protect machinery.





Asphalt concrete aggregate was produced for E. L. Yaeger's desert project by this plant, designed to handle considerable oversize as well as eliminate large quantities of fines. At the far end a dozer-fed loader belted alluvial stone to a vibratory grizzly and a 35 x 54 primary jaw crusher, by belt again

to 4 x 14 double-deck Symons shaker screen for separation of sand and rock (uncrushed sand belted to stockpile here); remainder again belted, to setup seen in foreground: a 5 x 16 double-deck Symons screen with split delivery to paired Telsmith 4-ft. cones for secondary crushing and recircula-



New West-Bound roadway for I-15 showing the California engineer's base and pavement design for the US 91-466 desert freeway project.

Improved screen, set up with dozer-fed belt at one gravel pit to correct gradation of base aggregate. The left part of screen diverted 1/4-in.-minus material to waste pile; the right part scalped oversize and dropped the 1 1/2-in.-maximum remainder into trucks.





tion. Three stacker belts from this stand took crushed sand, $\frac{3}{4}$ in. stone and $\frac{1}{2}$ in. stone to stockpiles over the 180-ft. tunnel belt, leading to the hot-mix plant. A Caterpillar 150-kw Model 337 and 75-kw Model D1300 set powered all of the crushing plant except the cone crushers, each run by the engines from Cat DW20s.

Pictured here is an example of equipment used in one pit for correcting gradation of a sand-gravel deposit. A belt loader put material on a split screen. Part of the material passing a No. 4 mesh section was caught by a pan and diverted to a waste pile. A $1\frac{1}{2}$ -in. mesh section scalped boulders, dropping the remainder directly into the haul-away truck.

3. Asphalt Concrete. The asphaltic layers include a total 0.54 ft. base placed in three equal courses topped by a .04 ft. carpet of open

graded mix—7-in. combined thickness of asphaltic concrete. The mix for all courses is produced from four aggregates consisting of $\frac{1}{2}$ -in. maximum coarse crushed rock, uncrushed sand, crushed sand and (for the top carpet) a No. 3 rock. Limestone dust was added to equal a minimum of 25 percent of the total material passing the 200 screen. Rock and sand are combined variously in design mixes to give the desired gradation and other required characteristics. As added insurance for the best struc-

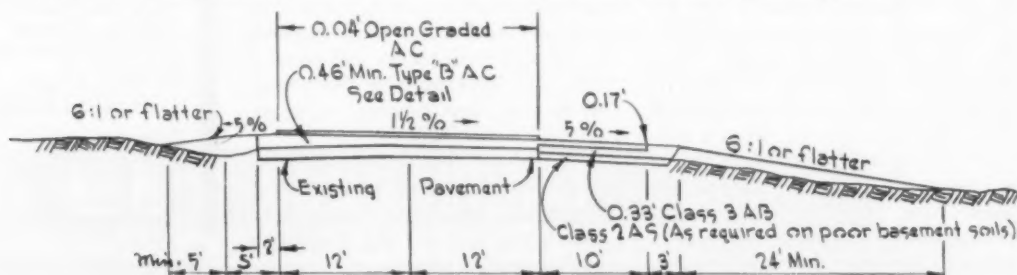
tural material, new State specifications require that "no portion of the product of the crusher is permitted to be wasted."

Type B California asphalt concrete is used for all but the carpet layer. For this class of mix the combined aggregate must have sufficient roughness to meet stabilometer test, with however no requirements as to the percent of fractured faces. Trial blends of rock and sand, including crushed sand, were necessary to arrive at an acceptable combined aggregate.



Centerline checking of thickness control for the one-half-inch open-graded topping.

How the existing roadway will be converted to the east-bound for the I-15 development.

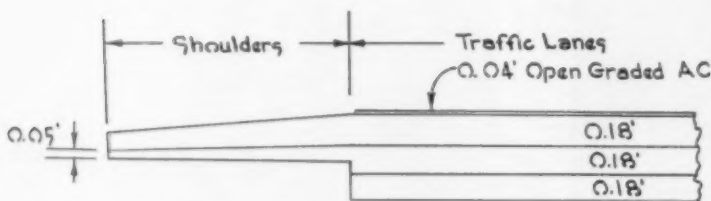


Gradations for California US 91-466 Project Aggregate Requirements for Base and Subbase Courses

Screen size	1/2 in. Maximum Coarse	% Passing
3/4 in.		100
1/2 in.		95-100
3/8 in.		75-90
No. 4		50-67
No. 8		35-50
No. 30		15-30
No. 200		4-7

Open Graded Asphalt Concrete

Screen size	No. 3 Maximum	% Passing
3/8 in.		100
No. 3		85-100
No. 8		15-32
No. 16		0-15
No. 200		0-3



Asphaltic concrete components for the (west-bound) roadway. Overlay layers for modernizing the existing road as the east-bound include a leveling course (0.08 ft. min., two 0.19 ft. courses and the 0.04 ft. open graded topping.)

Further illustrating today's relatively high quality standards, the combined aggregate was specified to have a Los Angeles rattler loss of not exceeding 50 percent, stabilometer value of 35 minimum, and meet other comparable quality standards.

An additional requirement was specified for the open graded asphalt concrete used in the 1/2-in. thick wearing surface, in that the mix must have 90 percent fractured particles. The qualities sought here are exceptional skid resistance and differentiation in appearance from the asphalt shoulders. In addition, this material must have low abrasion loss as well as meet tests for film stripping.

The open graded wearing carpet has been placed with entire success with a paver travel as high as 110 ft. per minute.

The 1/2-in.-thick open graded carpet is feathered to near zero thickness in the outer 12 in. of width on either side. Feathering has involved no laydown problem with the Barber-Green pavers; merely adjusting a 12-in.-wide screen extension. Also there have been no problems in maintaining an accurate 1/2-in. compacted thickness. Compaction fol-

lowed standard procedures using steel-wheeled rollers which worked the feathered edges first.

Again reflecting today's close testing control, numerous cores have been taken from the completed portions to determine how close the layers of asphaltic concrete and base material have been held to planned thickness and elevation. Results have shown few variations of more than .02 ft. Profileograph readings have been exceptional and riding qualities are equally good on the project to date.

The foregoing descriptions chiefly concerns the new second roadway. Conversion of existing U.S. 91-466 to serve as the East-bound roadway of I-15 will use the saving paving mixes, but with different thickness. The standard resurface: 0.08 ft. min. leveling, two 0.19 ft. courses, and the 0.04 ft. carpet. At summits and other spot locations the grade or alignment will be modified to improve the geometrics, using the "new paving" cross section here sketched.

Paul Rolle is superintendent for the contractors on the US 91-466 desert job, and J. O. Erwin is resident engineer for the California Division of Highways.

McCONAUGHAY LICENSEES Operating K. E. McConaughay Emulsified Asphalt Plants

ALABAMA

Vulcan Asphalt Refining Co., Cordova

FLORIDA

E. A. Mariani—Emulsified Asphalt
Hooker's Point, Tampa

ILLINOIS

Emulsions, Inc.—Lawrenceville

INDIANA

Bituminous Materials Co.
P. O. Box 1140, Terre Haute
Wabash Valley Asphalt Co., Terre Haute
Walsh & Kelly
R. R. No. 2, Gary
Brookman Construction Co.
17th & Gharkey Sts., Muncie
Fauber Construction Co., Lafayette
Asphalt Materials & Construction, Inc.
4800 W. 86th St., Indianapolis
Bituminous Materials Co.
E. Swihart St., Columbia City

IOWA

Bituminous Materials & Supply Co.
409 Fifth Street, West Des Moines
Plants: Spirit Lake, LeMars, Carroll,
Algona, Lehigh, Davenport

KENTUCKY

Emulsified Asphalt Co.—Kuttawa

LOUISIANA

Bituminous Materials Co.—Metairie
Serving Mississippi and Louisiana

MAINE

Doherty and Swearingen Co.
53 Main St.—Yarmouth

MASSACHUSETTS

James Huggins & Sons, Inc.
Medford & Commercial, Malden 48
Koppers Co., Inc., Railroad Ave., Westfield

MICHIGAN

Bituminous Materials Co.
318 Atlantic St., Bay City
Bituminous Materials Co., Escanaba
Bituminous Materials Co.
416 S. Water St., Jackson

NEW YORK

Koppers Co., Inc., Utica
Koppers Co., Inc., Knight Paving
Products Dept., 1635 Union Rd., Gardenville
Koppers Co., Inc., Knight Paving
Products Dept., Vine Street, Ithaca
Koppers Co., Inc., Knight Paving
Products Dept., 1980 East Ave., Rochester 10
Koppers Co., Inc., Knight Paving
Products Dept., Watertown
Koppers Co., Inc., Knight Paving
Products Dept., Syracuse
Albany Asphalt & Aggregates
75 State St., Albany
Bimasco, Inc., (2 plants)
312 Brook St., Bayside, L.I., N.Y.

OHIO

C & C Emulsions—Van Wert

SOUTH CAROLINA

Seaco Incorporated
2700 Industrial Drive, Columbia

TENNESSEE

Asphalt Products Co., Inc.
Powell Ave., Nashville 4
Road Materials, Inc.
3107 McClure Lane, S.E., Knoxville

CANADA

T. J. Pounder & Co., Ltd.
1474 Wall St., Winnipeg, Man. (4 plants)

Eastern Representative:

John A. Dow
157 Church St., New Haven 10, Conn.

Export Representative:

William H. Schuelie
440 E. 9th St., New York 21, N.Y.

PROVEN SKID-RESISTANT SURFACING

McCONNAUGHAY Asphalt Emulsions Mixed Hot with Sand



Airport runway resurfaced with skid-resistant emulsified asphalt hot sand-mix $\frac{1}{2}$ " thick.



Emulsified asphalt hot sand-mix $\frac{1}{2}$ " thick over emulsified asphalt hot open-graded binder.

Skid-resistance is one of the most important features to be considered in pavement engineering for highways and airports... and McConnaughay Licensees (list on facing page) offer efficient engineering service and the right materials for all types of emulsified asphalt pavement construction, including those with special skid-resistant properties. For a complete discussion of skid-resistant pavements and specifications, write or call...



Emulsified asphalt hot sand-mix $\frac{1}{2}$ " thick over old bituminous concrete.



Emulsified asphalt hot sand-mix $\frac{1}{2}$ " thick over old bituminous concrete.

K. E. McCONNAUGHAY

LAFAYETTE
INDIANA

EMULSIFIED ASPHALT PLANTS AND PROCESSES



Slippery pavement being resurfaced with slag type Pennsylvania FJ-1 bituminous concrete surfacing.



Photo showing sign placed at each end of slippery pavement section.

Slag Mix Placed To Correct Slipperiness

A bituminous surfacing constructed on a section of Route 422 east of Indiana, Pennsylvania, recently became so slippery under traffic that special signs were posted at each end of the project. Speed was held to 35 mph to alert the public to the hazard. Use of "polishing" type aggregate was blamed for the condition.

Notwithstanding the precautions, several serious accidents occurred, compelling the state department of highways to take corrective measures. The prescription was to place a slag bituminous surfacing over the affected section. The mix and procedure were in accordance with the Pennsylvania state highway specifications for bituminous surface courses, FJ-1.

Composition of this mix was as follows:

Sieve Number	Percent Passing
3/8 in.	100
4	90-100
8	70-100
16	40-80
30	20-60
50	5-40
100	0-20
200	0-10
Asphalt cement % by weight	6-12

The slag mix was recommended because of the resistance of the sharp-edged slag particles to wear under traffic; the initial skid resistant texture has a demonstrated ability to retain its characteristics.

Paving Technologists Meet at Charleston

Of interest to engineers, scientists, and others in the bituminous paving industry will be the 35th Annual Meeting of The Association of Asphalt Paving Technologists. It will be held at the Francis Marion Hotel in Charleston, South Carolina on February 6-8, 1961.

This organization, with membership on a world-wide basis, is devoted to the advancement of asphalt paving technology through the encouragement of research and exchange of information. The five technical sessions scheduled at Charleston will include papers on such subjects as fundamentals of asphalts and fillers, viscosity measurements, design and control of paving mixes, plant mixing and drying, viscous resistance and flexibility of pavements, densification under traffic, pavement evaluation, and a Symposium on "Asphalt Bonded" bases.

Details can be obtained from the Secretary-Treasurer, Ward K. Parr, at 1224 East Engineering Building, Box 619, Ann Arbor, Michigan.

1960 Asphalt Tonnage At All-Time High

A new all-time high year of asphalt sales of more than 21.5 million short tons in 1960 was estimated by Dr. J. E. Buchanan, president of The Asphalt Institute. In reporting to members of the Institute's board of directors at the Institute's recent annual meeting, Dr. Buchanan said this figure would represent a 3 percent increase over 1959, the previous record high.

At the same time Institute members mapped an intensified drive to promote greater use of modern, heavy-duty asphalt paving on the Interstate-Defense roads in the Great Plains states and those states rimming the Great Lakes. This great heartland of America, traditionally heavy users of rigid-type pavement on its superhighways, has shown the same preference for portland cement concrete on the new multiple-laned highways, the Institute delegates were told. The Institute's five geographical divisions are studying their manpower needs as a preliminary to reinforcing their engineering field forces.

The Institute announced that its midyear board meeting will be held June 21-22, 1961 at the Hilton Hotel, Denver, and its 1961 annual meeting again will be held at Washington.

The Institute has elected as its new chairman of the board L. P. Street of American Bitumuls & Asphalt Co., Baltimore. He succeeds E. M. Stone, Empire Petroleum Co., Denver.

New divisional vice presidents for 1961 were elected as follows: (*Atlantic-Gulf*): A. R. Curtis, Esso Standard, Div. of Humble Oil & Refining Co., (senior v.p.); R. C. Hawks, Mobil Oil Co., a Division of Socony Mobil Oil Co., Inc. (*Ohio Valley-Great Lakes*): J. W. McCracken, Byerlyte Corp.; S. J. Diegel, Sinclair Refining Co. (*Midwest*): F. H. Brown, Mobil Oil Co.; R. S. Ketcham, Anderson-Prichard Oil Corp. (*Southwest*): A. T. Van Pelt, Berry Asphalt Co., E. F. Shannon, Continental Oil Co. (*Pacific Coast*): George T. Goggin, Douglas Oil Co. of Calif.; Roger M. Clark, Wilshire Oil Co. of Calif.

ASCE Urges Standards

The professional responsibilities of an engineer were sharply defined at the recent annual convention of the American Society of Civil Engineers. Frank A. Butrico of the U. S. Public Health Service, reminded delegates that completion of certain academic requirements does not of itself entitle the engineer to "lasting professional recognition."

"Just as the doctor must meet certain standards and comply with licensing procedures, so should the engineer before being allowed to

practice engineering," Mr. Butrico stated. He referred to ASCE's requirement that no member can now reach ASCE's highest grade, of Fellow, unless he is a registered engineer of the state he operates in.

Mr. Butrico offered four criteria, or characteristics, of the professional man: willingness to work to advance the profession, registration, communication and leadership in public life. He deplored the unwillingness of many engineers to contribute technical articles to help advance the profession.



Designed for maximum payload ...the new Etnyre model FX-500!

Talk about payload! Compare these Etnyre capacities to *your* state load limits:

- 1550 gallons for single 18,000# axle
- 1690 gallons for single 20,000# axle
- 1840 gallons for single 22,400# axle

You can count on similar greater maximums on semi-trailer single and tandem axle mountings too! And dependable operation, and uniform, accurate distribution are always typical of the results you can expect from an Etnyre. Look at the sharp, clean edges and the even distribution in the above photo of an Etnyre FX-500 and you can see the results of Etnyre's exclusive triple-lap coverage.

OTHER FX-500 QUALITY FEATURES:

- Hardened aluminum jacketing over 2" Fiberglass insulation which is reinforced with molded asbestos blocks
- Stainless steel jacket near burners and exhaust stacks
- Stainless steel heat jacket for pump
- Aluminum fenders and mud flaps.

You're familiar with Etnyre's accuracy and dependability . . . now you can get maximum payload too . . . for maximum profit. Investigate today — find out how a "Black-Topper" can handle more work . . . faster . . . better . . . more economically.

SEE YOUR ETNYRE DEALER

ETNYRE
"Black-Topper"
 BITUMINOUS DISTRIBUTORS



. . . for more details circle 337 on enclosed return postal card

NEW PRODUCTS

Listed here are reviews of new and improved equipment items, selected to aid our readers in purchasing. See reader service numbers on enclosed postcard.*



Heltzel plant erected and operating. The wheels remain attached, the chasis blocked slightly above the wheel height.



In travel the new Heltzel plant stands 12 ft. 6 in.—folds down to a size and shape easily handled on the road.

Heltzel Announces New Batch Plant Portable

A new portable batching plant that can boost maximum mobility, high capacity production and speed and economy in erection was announced last month at a demonstration in Cleveland.

Simplified so that even the con-

veyor system travels attached to the rest of the machine, the plant is raised to a working position in about five minutes by its own hydraulic system. The complete erection takes 2 men 3 hrs to complete. The series 900 can produce from 90 to 270 cu. yd. per hr. and can be furnished with either 2 or 3 belt conveyor systems. The aggregate

unit, the other half of the plant, is available in either 2 or 3 compartments. Low loading height of 7 ft. 10 in. can be used for charging with a front end loader. Charging by crane or with a high reach loader can be accomplished using the 10 ft. 4 in. bin side walls. The low height holds 54 tons—the high, 75 tons.

Transportation is made possible because of the low travel height—12 ft. 6 in. for the cement unit—10 ft. 4 in. for the aggregate bins.

Heltzel Steel Form & Iron Co., Warren, Ohio.

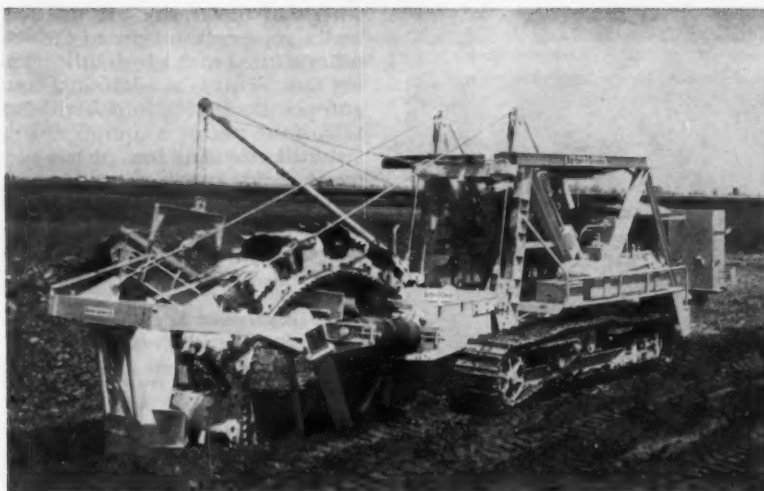
for more details circle 101 on
Enclosed Return Postal Card.

Full-Crawler Wheel Ditcher

Reported to be the world's largest and most powerful, full-crawler wheel ditcher, the Model 777, has been announced by Barber-Greene Co. Aurora, Ill. The Model 777, designed for heavy-duty cross-country pipeline work, digs 54 in. wide and 8 ft. 6 in. deep. The trench width at the top may be increased to 9 ft. or more through the use of slopers.

Independent full-hydraulic drive to each track and exclusive Barber-Greene, dual-range "Hydra-Crowd" gives the operator full time power

*To readers outside of the United States—postal rules forbid use of business reply cards outside of the U.S. Please write to us listing the numbers, month and name of magazine, and mail with your name and address to Inquiry Dept., Roads and Streets, 22 W. Maple St., Chicago 10, Ill., U.S.A.



B-G's Crawler Wheel Ditcher

steering, one-lever control while digging on the straight-away, permits an infinite range of crowding speeds from zero to 33 fpm and allows the machine to turn around within its own length when maneuvering into or out of position.

All machine operating functions are completely independent of each other and made possible by use of hydraulic controls throughout. This same use of hydraulic controls allows convenient and functional grouping of all controls and greatly lightens the operator's work load. The soil conveyor on the Model 777 is hydraulically driven, and belt speeds are infinitely variable up to 1,000 ft. per min. The discharge conveyor thus, is never a limiting factor on ditcher production, even when digging at top speed and at full depth. Rubber impact idlers

support the belt at the point of discharge from the buckets.

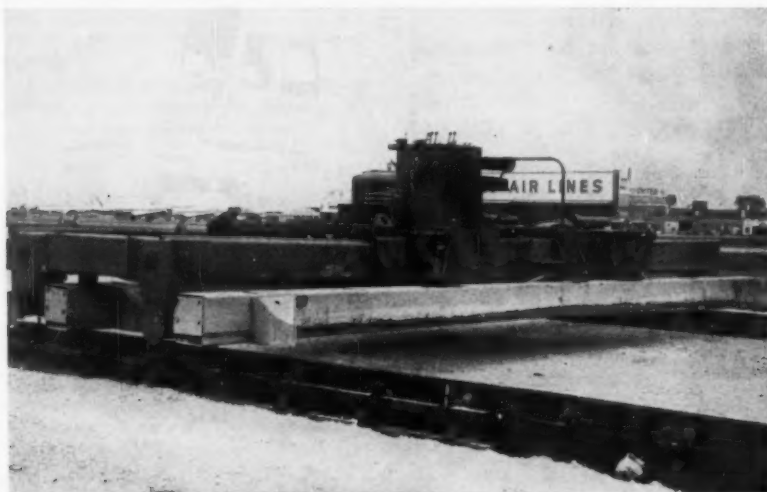
Barber-Greene, 400 N. Highland Ave. Aurora, Ill.

For more details circle 102 on Enclosed Return Postal Card.

Self Widening Finishers

A new self-widening concrete finisher designed for road and airport paving but reported versatile enough for many other construction operations, has been introduced by Blaw-Knox Company.

Operator control is simplified on the self-widening finisher through centrally located electric push buttons and hydraulic operating levers. Also open grating is utilized on the floor of the machine to afford good visibility of all paving operations. Widening action of the machine is



Blaw-Knox Self-Widening Finisher

POKER? Play to win!

How would you play these hands?

In coming months we'll discuss how most "experts" (steady winners) would play the above hands in draw poker, jacks or better to open, 6 or 7 players in the game.

Every hand involves some basic principle of good poker playing. Simple rules, but ones which are most often violated by most good losers. Of course, following the rules is no guarantee you'll win. But, you should win more often.

Ford is not recommending that you gamble. But if you do play poker for money, chalk or marbles... or for that matter, just for the fun of it, you'll probably enjoy the game even more when winning.

In the same series, we'll be telling you of another way to win with Ford, and with no gamble at all: simply by using Ford tractors and equipment to help solve the problems of your job.

Next month, for instance, we'll announce a cash-money offer which so far as we know has never before been made in this field. Watch for it. It could be worth more to you... well, maybe more... than a royal flush!

Tractor and Implement Div.,
Ford Motor Company,
Birmingham, Michigan



... for more details circle 297 on enclosed return postal card

New Products



Self Propelled Sheepfoot

accomplished during finishing operations when necessary. The unit is power self-widening through a full range of 12 to 28 ft. without frame alteration, in a wide range of increments, and automatically positions without additional clamping. Wheels are moved from inside to outside hubs for widening from 15 to 31 ft. Heavy duty box type members are employed in the finisher's frame, and telescope into one another to effect changes in width. Various screed arrangements are available in both crown bolt and quick adjustable types. Screed speeds are variable between 40 to 105 strokes per min. and are independently controlled from traction.

Blaw-Knox Co., Construction Div.,
Mattoon, Ill.

For more details circle 103 on
Enclosed Return Postal Card.

Self Propelled Sheepfoot Roller

Drums to convert several types of prime movers to self propelled sheepfoot rollers are now offered by W. E. Grace Mfg. Co.

Drums are 6 ft. in dia. with 8-in. feet having 7 sq. in. area, providing tamping pressure of over 700 lb. per sq. in. Usual arrangement is for drums 3 ft. wide replacing the pneumatic tired driving wheels of the tractor (welded to the old wheel rim when an old tractor is converted). This leaves a 5 ft. un-

rolled center strip, which is covered by the third trailed drum, producing 11 ft. rolling width with no unrolled strip.

The tractor is able to run in 3rd gear in average going at 8 to 10 mph. At this speed it will cover three times as much area per hour as two 5 ft. wide drums drawn by a crawler tractor. Outside diameter of turning circle is 40 ft. The usual brakes and steering is used on the tractor.

When it is not practicable to turn the unit around on the fill, the front

wheels of the tractor are omitted, and a gooseneck tongue to the 3rd drum is fitted with a hydraulic steering ram. This is at additional cost, and permits rolling in either direction, if the tractor is equipped with a shuttle reversing box, or has adequate reverse speeds already.

Adjustable cleaner bars are furnished front and rear. The conversion may be made at the factory in Dallas or by the contractor in the field.

W. E. Grace Mfg. Co., 6007 S.
Lamar St., Dallas, Texas

For more details circle 104 on
Enclosed Return Postal Card.

Electric Digger

A new electric wheel powered scraper with a capacity rating of 30 tons has been announced as an addition to its "Pacemaker" line by R. G. LeTourneau, Inc.

This Series L-28 electric digger is the first small machine to be manufactured by the Texas concern since it re-entered the earthmoving equipment business.

A 420 h.p. diesel-electric power plant and driving wheels both "fore and aft", the Series L-28 is also a self-loading scraper in many types of material.

The Series L-28's operating principal is the "shuttle" cycles between borrow and fill. In "shuttle" operation the machine never turns around. It moves forward to dig, haul, and dump; moves back to get into digging position again. The electric wheel drive offers the same power and speed in either direction,



LeTourneau's Electric Digger

and the two axle suspension with all-wheel drive makes forward or reverse steering equally easy. To facilitate this type of operation, the L-28 is equipped with a rotating seat and control panel. Instead of turning the machine, the operator merely turns as he would in a swivel chair. A small control panel remains in front of him at all times.

R. G. LeTourneau, Inc., 2399 S. MacArthur, Longview, Texas

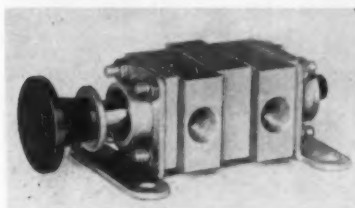
For more details circle 105 on Enclosed Return Postal Card.

Mechanical/Manual Control Valves

A new mechanically or manually operated valve design has been introduced by Hoffman Valves, Inc., for control of air, oil or vacuum.

These are 1/4 in. NPT, 2-position balanced spool valves available in normally closed or normally open 2 way, 3 way and 4 way styles. Manual and mechanical operators range from knob operators through lever, clevis, roller cam, foot pedal, treadle, and air operators. These valves are designed for pressures from 29 in. H.G. Vacuum to 250 psig.

The new valve segment is the key to the valves' modular design which per-



Hoffman Valves

mits variations in valve styles utilizing less than fifty standardized, interchangeable parts. This means few spare parts need to be stocked by the user. Another feature is four position porting. Each port segment may be assembled in any one of four positions for flexibility in piping.

Hoffman Valves, Inc., 2360 West Dorothy Lane, Dayton 39, Ohio

For more details circle 106 on Enclosed Return Postal Card.

Air Drill

Adaptation of the Thor 15DL dustless air drill as a combination drill and hammer for placing concrete anchors has been announced by Thor Power Tool Company.

The unit utilizes a dust-inhaling system which draws the drilling dust through the unit and into the dust extractors while the anchor hole is being drilled. The drill then converts to hammer action by a turn of the lever. An expansion bit is fitted into the bit end of the anchor and the anchor is permanently set through a series of

hammer blows. The unit is available for this type of application as the Thor 15DL drill kit with adaptors for concrete anchors from 1/4 to 3/4 inches.

Thor Power Tool Co., 175 N. State St., Aurora, Ill.

For more details circle 107 on Enclosed Return Postal Card.

Portable Mix Plant

A new portable stabilized base mix plant that includes pugmill, conveyor, bins, plus piping and metering equipment and mounted on wheels, has been announced by Universal Engineering Corp.

The Universal portable Thoro-Mix, as the new plant is named, has produced in capacities up to 500 tph. of spec meeting material, according to the manufacturer. The pugmill, either twin or single shaft, is mounted at the end of a 24 in. conveyor and above the truck dumping minimum. Accurate calibrated valve controls the metering of water to the spray bars. All equipment, including a centrifugal type pump, is mounted on the portable frame at operator's waist level.

Universal Engineering Corp., 625 "C" Ave., N.W., Cedar Rapids, Iowa

For more details circle 108 on Enclosed Return Postal Card.



field proven in
18 states...

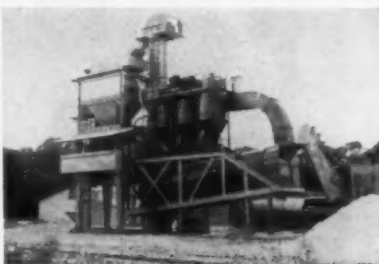
"the **CUTLER**
REPAVER!"

SAVES THE ROADS! SAVES TAX DOLLARS!

The ONLY machine that will completely restore an existing asphalt pavement to its original riding surface. It HEATS, LEVELS, RELAYS and COMPACTS the original hot mix AND THEN... machine lays a new 1/2" uniform hot mix surface.

THE
COMPLETE COST
IS LESS
THAN 1/3 THE
COST OF
NEW PAVEMENT

BATCH TYPE HOT MIX ASPHALT PLANTS



20 - 40 - 60 - 120 TONS
CAPACITY

Engineered and custom built in our own plants to fit the particular requirements that apply to your state and locality.

PLEASE WRITE FOR FREE COLOR BROCHURE ON EITHER CUTLER ENGINEERED MACHINE.

CUTLER ENGINEERING COMPANY

5435 WEST 63rd STREET • CHICAGO 38, ILLINOIS

A DIVISION OF ASPHALT EQUIPMENT AND ENGINEERING COMPANY

... for more details circle 288 on enclosed return postal card

New Products

Instrument Line

A new line of David White instruments featuring compact size and light-weight has been announced. The new instruments are called the Continental No. 8040 Level-Transit and the Continental No. 8050 Level.

The new instruments offer an accurate, simple to use instrument. Both instruments are constructed of die cast high strength aluminum alloy with smooth enamel finish. Leveling plates



White Level Transit

are chrome plated and have a permanent built-in quick lubricating system. The circle rotates for zero settings and reads to degrees. Both instruments have 8X power telescopes with micrometer ring focusing. The 8040 Level-Transit features a positive level locking device that quickly secures the telescope in a true level position. The 8040 weighs 2 lb. and stands 6 in. high.

David White Instrument Div., Realist, Inc., Menomonee Falls, Wis.

For more details circle 109 on Enclosed Return Postal Card.

Gasoline Engines Announced

Two new series of gasoline powered models which follow closely the intro-



Diamond T-s Gas Models

duction of several new diesel models have been announced by Diamond T.

According to the manufacturer, these new gas engines are light in weight, but have heavy-duty construction which fits them for a variety of applications both on and off highway. Models 4000 and 4300 are powered with the modern high output engines of short-stroke, valve-in-

head design and have wet-sleeve construction. Wet-sleeve construction means a precision engine which has replaceable cylinder sleeves machined inside and out. The sleeves retain a perfect round indefinitely, greatly extending piston and ring life states Diamond T.

Diamond T Motor Truck Co., 4401 W. 26th St., Chicago 23, Ill.

For more details circle 110 on Enclosed Return Postal Card.

Dry Cement Hose

Dry bulk cement now can be pumped into storage silos through special hose from tank trucks similar in appearance to those that haul gasoline, according to B. F. Goodrich Industrial Products Co.

The tank is divided horizontally by a woven canvas "wall". Up to 800 cu. ft. of dry cement can be poured into the top compartment. The lower compartment is left empty. The canvas is strong enough to support the cement, but sufficiently porous to permit air penetration under pressure. Air forced into the empty lower compartment passes through the canvas and "floats" the cement through the delivery hose at the rate of 5 barrels a min. A truck carrying a full load can discharge it in less than 30 min. The hose, light, flexible and built for use on rugged terrain in any weather, has a 4-in. inside dia. lined with a tough rubber that resists abrasion from flying cement particles.

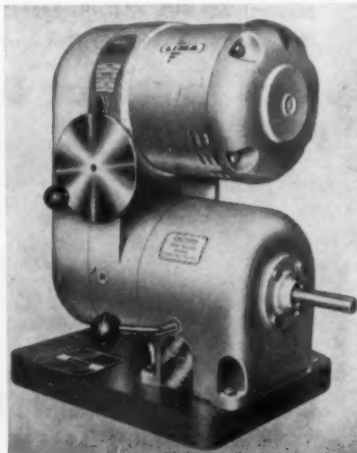
B. F. Goodrich, Akron, Ohio

For more details circle 111 on Enclosed Return Postal Card.

Variable Speed Drive

Availability of an infinitely variable speed drive, the Lima Vari-Gear Drive, has been announced by the Lima Electric Motor Co., a subsidiary of the Consolidated Diesel Electric Corp.

ERPM between 180 and 1,800 is obtainable with the unit when an 1,800 rpm motor is incorporated. Using a



Lima Vari-Gear Drive

1,200 rpm motor, all speeds between 120 and 1,200 are obtainable. Either drip-proof or totally enclosed fan-cooled units can be furnished in 1/2 or 3/4 hp. A four speed transmission is incorporated resulting in maximum torque, the maker states. A single control wheel regulates the output shaft to the desired rpm with a pointer indicating on a calibrated speed plate the exact rpm.

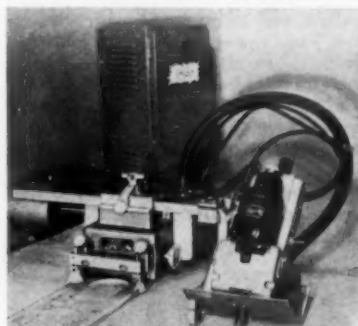
The Lima Electric Motor Co., Inc., Dept. 280, Lima, Ohio

For more details circle 112 on Enclosed Return Postal Card.

Automatic Torch

The development of its new Model Q-5 heavy-duty, automatic Arcair torch has been announced by the Arcair Co. The Model Q-5 was designed to automatically groove seams and prepare the edges of heavy plate for welding.

The complete unit consists of a tractor-driven automatic head featuring all



Arcair Torch

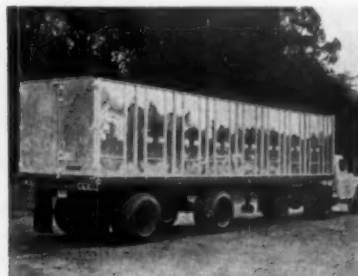
position adjustment of electrode angle and variable electrode feed. Included also is a contactor with remote control switch. This provides maximum safety for operator and equipment by providing means of quickly cutting off power from the arc. It is designed to use electrodes ranging in size from 1/4 in. to 3/4 in. maximum dia.

Arcair Co., Lancaster, Ohio

For more details circle 113 on Enclosed Return Postal Card.

Platform Trailer Versatility

New interlocking aluminum panels which allow operators to quickly and easily convert their platform trailers to open top units in less than an hour, have been announced by Fruehauf Trailer Co.



Fruehauf's Aluminum Panels

Interchangeable between their steel, lightweight steel, and aluminum platform trailers, Fruehauf says the panels are fitted together with interlocking extrusions to give proper stability for open top operation. Each panel, which can be removed without disturbing the adjoining rack, is equipped with a lifting bar on the outside and hand clasps on the inside for easy handling by one man without special equipment. The top of each rack has provision for 2 steel tarp bows set on 24-in. centers. At the bottom of each panel are 2 steel stake inserts that fit snugly into the standardized pockets of all Fruehauf platforms. When not in use, panels and tarp bows are housed in the front of the vehicle. To close off the cargo area in the rear, Fruehauf uses plymetal doors with a full height cam locking engagement operated from the ground, and an integral split header, that gives the doors rigidity when locked.

Fruehauf trailer Co., Detroit 32, Mich.

For more details circle 114 on Enclosed Return Postal Card.

Mobile Storage Bins

The construction equipment division of Clark Industries, has announced a line of completely mobile ground storage cement bins.

Rectangular in design and offered in capacities of 465, 555 and 645 bbls. all



Clark's Portable Bins

models are built with a heavy fifth wheel to fit any standard tractor and truck, and a complete rear axle assembly with standard air brakes and 10 in. x 20.00, 12 ply truck tires. They are also equipped with stop lights, tail lights, turn signals, and standard trailer reflectors. Each unit is completely equipped with all standard bin accessories, such as access hatch, inside ladder, emergency slide gate, bin-flow pads, discharge valves, and air delivery intake unit. Reportedly, these units can be installed in any existing cement batching setup.

Clark Industries, 375 E. Fifth Ave., Columbus 1, Ohio

For more details circle 115 on Enclosed Return Postal Card.

Rear Mounted Push Block

A new Rear Mounted Push Block that is designed for easy installation or removal is now in production at Push-in'-Cushin', Inc.

Fastened to the drawbar and held in place by the drawbar pin, the support bars extend from the top of the block to top of drawbar mounting thus eliminating stress on the tractor undercarriage. The rear block can be removed in five minutes by removing the drawbar pin and the two pins in the support bars. It is available for H Series D-8's and all series D-g's. The rear mounted push block is a casted, fabricated unit weighing approximately 1,000 lbs.

Pushin'-Cushin, Inc. Perry, Kansas

For more details circle 116 on Enclosed Return Postal Card.

Safety Caps

A new safety device that will permit the free use of steel gads or pins without the damage of flying steel particles has been announced by Carson's of Fort Worth, Texas.



Carson's Rubber Safety Cap

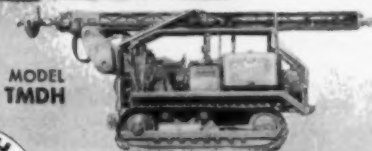
A WILLIAMS DIGGER FOR EVERY PURPOSE!



MODEL
BDH



MODEL
BDHU



MODEL
TMDH



MODEL
LDH



MODEL
LDHU



MODEL
MDHU



MODEL
MF



HUGH B. WILLIAMS MFG. CO.

8330 Lovett Ave. • Dallas, Texas
Manufacturer

JOSLYN MFG. & SUPPLY CO.

2101 Corinth St. • Dallas, Texas
Distributor

WRITE FOR ILLUSTRATED DESCRIPTIVE LITERATURE

... for more details circle 332 on enclosed return postal card

New Products

At the same moment of contact, the end surface of the pin is covered by the hammer while the sides are covered by this safety device, a rubber collar. This contains particles that might otherwise be projected outward and cause serious injury or damage. The manufacturer reports that the device will last from four to six months under normal usage and in average rocky terrain.

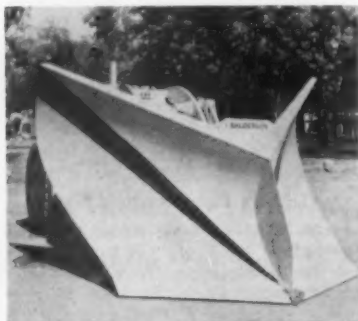
Carson's, 5025 Lovell, Fort Worth, Texas

For more details circle 117 on Enclosed Return Postal Card.

Snow Plows

A new, fast-moving snow plow that does not require extra casting wings is now being produced by Balderson, Inc.

A manufacturer of auxiliary equipment for Caterpillar machines, Balderson is making these new plows especially for use on the new Cat 966 Traxca-



Balderson's V Plow

vator. The Balderson BV966 has easy-pushing moldboards, with a smooth conically-formed curvature that practically eliminates the need for extra side-wings. An additional feature of the BV966 plow is its easy attachment in place of the Traxcavator bucket. Special bracing adds to plow strength without reducing speed and efficiency with overweight construction.

Balderson, Inc., Wamego, Kan.

For more details circle 118 on Enclosed Return Postal Card.

Three Way Blade Action

The first model of the new Paydozer line, the D-120, was recently announced by the Frank G. Hough Co.

The unit is powered by a 300 hp. turbo-charged diesel engine and weighs 55,000 lbs. The three-way blade action includes lifting and lowering, forward and backward pitch as well as side tilt. A unique feature of the D-120 dozer is the fact that it can be converted into a front-end loader whenever new projects or different working conditions dictate need for loader rather than dozer units. The optional package which permits this conversion includes boom arms, hydraulic lines, bucket and linkage together with one element of the



Hough Dozer-Loader

torque-converter for loader operation. The entire change can be made in less than two, eight-hour working days states the company.

Features of the basic D-120 unit include full-power-shift transmission, full-reversing and constant-mesh type transmission with four speed ranges forward and reverse.

Frank G. Hough Co., Libertyville, Ill.

For more details circle 119 on Enclosed Return Postal Card.

New Luminaires

Two new luminaire models from Joslyn Mfg. & Supply Co., were recently announced.

The first is an open-refractor luminaire consisting of an alzak-processed aluminum reflector and standard NEMA head and reflector. It is easy to relamp because of the open bottom. It



Joslyn Open-Refractor Luminaire

will accommodate incandescent lamps up to and including 6000-lumen or 175 watt mercury lamps. A second model being offered features louvers and vent to insure cool operation of electrical components with 400 watt lamps. The unit is mounted on a sturdy saddle attached directly to the pipe bracket.

Joslyn Mfg. & Supply Co., 155 N. Wacker Dr., Chicago 6, Ill.

For more details circle 120 on Enclosed Return Postal Card.

Portable Electric Power

A heavy duty portable electric generator which produces 3000 watts of AC

power has been introduced by Borg-Warner Corp. Trade-named Zeus, the new Model GW-300 will provide packaged power on the job site or in other remote locations where electric power is needed.

Electric power is generated by a permanent magnet rotating field. This operating principle completely eliminates all brushes, slip rings, or commutator. The permanent magnet, internally fan-cooled and corrosion protected, connects directly to the engine shaft with no coupling. The new model is rated at 115/230 volts, 60-cycle, single phase. Powered by a rope-started, 1-cylinder, 4-cycle air-cooled gasoline engine, the unit will operate for approximately five hours of full load running on a fuel tank capacity of 2 3/4 gallons.

Borg-Warner Corp., Pesco Products Div., 24700 North Miles Road., Bedford, Ohio

For more details circle 121 on Enclosed Return Postal Card.

Earth Borer

A fully-hydraulic earth-boring machine for digging holes up to 4 1/2 in. in dia. and 35 ft. deep has been announced by the Utility Division of Highway Trailer Industries, Inc.

The "HCBMS" digger is equipped with all-way hydraulic or mechanical power leveling to provide a wide range



Highway Trailer Borer

of digging angles. The units are mounted on swing or spotters bases with hydraulic stabilizers for installation on standard truck bodies. Power supply for portable electric tools is provided from "Generac" 110-120 v. access outlets.

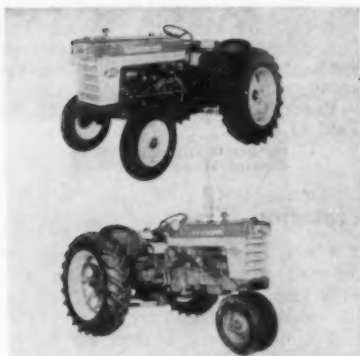
Highway Trailer Industries, Inc., New York 17, N. Y.

For more details circle 122 on Enclosed Return Postal Card.

Diesel Engine

A four cylinder diesel engine for International and Farmall 340 tractors has been introduced by International Harvester Company.

The plant furnishes 40 pto and an estimated 36 drawbar hp fitting the three to four-plow tractor class. Many parts of the new D-166 engine are interchangeable with parts from the six-cylinder D-282 and D-236 now in 460, 560



New IH 4-Cyl. Engine

and 660 series tractors. Individual glow plugs in each pre-combustion chamber enable the diesel to start in zero weather, maker states. Single fuel pump is said to be highly responsive to load change and is easily adjusted and serviced. Pintle-type self-cleaning injection nozzles and low friction pistons are used. The 340's are available with torque amplifier, capable of boosting pull power up to 45 percent. The TA gives two speeds in each gear, a total of 10 forward and two reverse.

International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

For more details circle 123 on Enclosed Return Postal Card.

Twin-Tip Scarifier

A new two-point reversible scarifier tip for road graders has just been announced by Allied Steel & Tractor Products, Inc.

Known as "Twin-Tip", this part features a point on each end, which permits the tip to be easily reversed on the scarifier shank when the initial point becomes worn. As a result "Twin-



Allied's Scarifier

"Tip" offers double the normal life of conventional replacements. Made of special alloy, shock-resistant steel, the tips are drop forged and differentially heat treated to provide maximum dependability. Wedge-action channel design securely locks part in position, insures a firm grip on shank regardless of operating conditions.

Allied Steel & Tractor Products, Inc., 7835 Broadway, Cleveland 5, Ohio

For more details circle 124 on Enclosed Return Postal Card.



Essick VR-72 Triplex Unit on Yuma Marine Auxiliary Air Station Job

COSTS CUT 2¢ PER YARD ON 1,000,000 CUBIC YARDS

SUNDT AND BEVANDA INCREASE COMPACTION PRODUCTION FROM 13,000 TO 18,000 CUBIC YARDS PER DAY

N. Pat Richardson, Project Manager for M. M. Sundt Construction Co. and M. J. Bevanda Co., Inc. of Yuma, Arizona writes:

"You will be interested to know that we were very impressed with the performance of our Essick VR-72 Vibrating Compactors on our recently completed Yuma Marine Auxiliary Air Station job. As you know, we used three VR-72's in a triplex hook-up which compacted a pattern of sandy silt 17-feet 8-inches wide. The job, under the jurisdiction of the 11th Naval District, called for 13,300' of Runway 200' in width, and 17,500' of taxiway 75' in width.

The one triplex unit of Essick VR-72's, along with 3 pushers and 10 scrapers allowed us to load, spread, and compact up to 18 thousand cubic yards in an 8 hour shift. We originally used other methods of compaction but the one Essick VR-72 Triplex Unit increased our production from 13,000 yards to 18,000 cubic yards per 8 hour day, and our compaction costs were reduced approximately 2¢ per cubic yard.

The material was a sandy silt with an average plastic index of 6. We put down in excess of 1,000,000 cubic yards on the complete job and in our opinion, the performance of the Essick VR-72's gave us a more successful and profitable job with greater production and lower costs."

For either low or high plastic index soils, there is an Essick Vibrating Compactor designed to produce greater compaction, at less cost for any compaction requirement.



9 Models of Vibrating Compactors from 13" to 72" widths

Also 14 Models of Tandem Rollers from 1/2 to 14 Tons

ESSICK MANUFACTURING COMPANY

1950 SANTA FE AVENUE
LOS ANGELES 21, CALIFORNIA

850 WOODRUFF LANE
ELIZABETH, NEW JERSEY

Affiliated with THE T. L. SMITH CO., Milwaukee, Wisconsin

... for more details circle 292 on enclosed return postal card

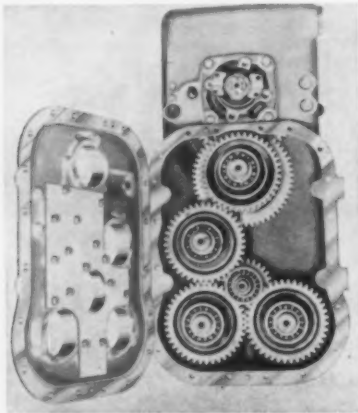
New Products

Power-Shift Transmission

Quantity production of a new power-shift transmission for off-road vehicles has started at Clark Equipment Co., it was announced.

Designed for the small machines that are built to do a big job, it is designated the 2000 series and designed for use with the Clark 270 series torque converter. It will be used with gasoline or diesel engines of approximately 200 lb. ft. of torque output. It has been accepted for use in several new lines of front end loaders, rollers and lift trucks.

Major feature of the design is a sys-



Clark's Power-Shifter

tem of four hydraulic clutches. These make available two speeds forward and two reverse, fully power shifted. A manual range selector is used, providing for four speeds in each direction. Reduction ratios are 4.78 and 2.53 in the two lower gears and 1.31 and 0.69 in the higher gears. The transmission is adaptable for either two or four wheel drive with output shaft 17 in. below the input shaft. The engine may be located in the front or rear of the vehicle. Front or rear wheel disconnect for operation in two or four wheel drive is an optional feature.

Clark Equipment Co., Automotive Division, Jackson, Mich.

For more details circle 125 on Enclosed Return Postal Card.

Slurry-Mixing Machine

A new slurry machine that makes possible the mixing and immediate application of the new popular slurry seal composed of fine aggregate, emulsified asphalt and water has been announced by Young Co., Texas.

The new machine, which may be mounted on any 2 or 2½ ton short wheelbase truck chassis, is easily operated by one man and a driver. It is a complete unit with balanced storage for emulsified asphalt, water and aggregates in separate compartments. A



Young's Slurry Machine

front end loader can be used to charge it with aggregate the same as a dump truck. There is no need to measure any of the three items. The emulsion and water are simply pumped into their respective compartments.

Provision is made for volumetric calibration of materials fed into a mixer located beneath and to the rear of the storage compartments. A screw type agitator in the mixer is built with a change of pitch at a point approximately one-third from the front end. This causes the material in the mixer to be churned toward the middle from both ends of the unit insuring thorough mixing.

The Young Co., P.O. Box 2369, Waco, Texas

For more details circle 126 on Enclosed Return Postal Card.

Special Duty Blade

Cold weather problem of wear-out on blades used for snow and ice removal by motor grader is said to be met with the Pacal X-Tra Edge blade manufactured by Paper, Calmenson & Co.

The unit can be used in conventional 2-piece arrangement, or as a 3 piece arrangement. In the 3-piece arrangement, the blade is center mounted where wear is normally greatest. The hardened steel blade increases in thickness from ½-in. at the top to ¾-in. at the wearable portion and is 8 in. wide. When installed the special center blade



Pascal Thick Center Blade

is flanked by two 8 in. end blades of ½-in. thickness. The manufacturer reports that the blades are self-sharpening.

Paper, Calmenson and Company, St. Paul 13, Minn.

For more details circle 127 on Enclosed Return Postal Card.

Flotation Tire

A new tire, which combines the off-the-road advantages of flotation tires with long mileage in highway service, has been introduced by Harmo Tire and Rubber Corp., Detroit, for use on transit-mix trucks, batch trucks and water buggies.

The Flo-Track tire design incorporates a special highway tread on a flotation tire body. It will deliver 30,000 miles between new treads in average



Harmo's Flo-Tracks

highway service, according to the manufacturer. The new tires will permit mixer and batch trucks to move freely from highway to difficult off-the-road terrains, such as sand, muck or hillsides, without slowing down and without changing tires. In addition, single 18.50 x 20 Flo-Track tires may be used to replace standard duals on single or tandem rear axles. Carrying capacity of the single tire is 23,000 lbs.

Harmo Tire & Rubber Corp., 1800 W. Fort St., Detroit 16, Mich.

For more details circle 128 on Enclosed Return Postal Card.

Epoxy Resin

A new high strength one-component modified epoxy resin adhesive that permits easy application techniques and provides unlimited working life for bonding high volume metal and plastic structural assemblies is now available from Adhesives, Coatings and Sealers Division, Minnesota Mining and Manufacturing Co.

Designated as Scotch-Weld Brand Structural adhesive EC-1595, this one component adhesive contains a latent hardener which eliminates the need of accurately weighing and mixing a hardener with the base resin at time of use. In addition, the adhesive has an unlimited working life and will not harden before curing operations are performed.

This adhesive is reported to provide metal-to-metal bonds, with shear strengths of 2500 psi at 75F and main-

tains high strength over a service temperature range of minus 67°F to plus 300°F.

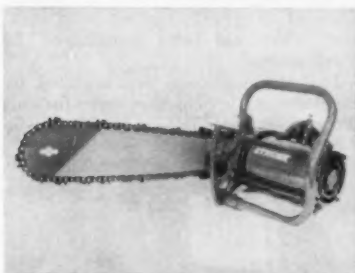
Minnesota Mining & Mfg. Co., 900 Bush Ave., St. Paul 6, Minn.

For more details circle 129 on Enclosed Return Postal Card.

Chain Saw

An electric chain saw has been announced as the newest product from Strunk Power for Modern Living, Inc., manufacturers of chain saws, emergency generators, portable pumps and riding mowers.

Motor of the units develops 7 hp; commutators, brushes, windings are de-



Electric Chain Saw

signed to withstand higher amperage load than the saw would use. A centrifugal clutch on the motor allows for smooth disengagement of the cutting chain and automatically disengages the cutting chain when the motor is brought down to a speed at which it would overheat.

Strunk Power for Modern Living, Inc., Coatesville, Pa.

For more details circle 130 on Enclosed Return Postal Card.

Motor Grader

The availability of a new motor grader, the model 330-H has been announced by LeTourneau-Westinghouse Co. This is a 100 hp unit, with the choice of power from either the GM 3-71 or the Cummins V-6-BI engines.

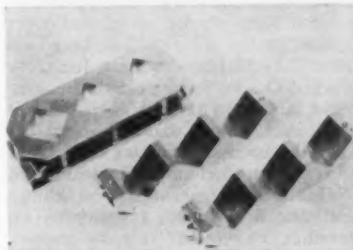
The model 330-H uses 9.00 - 24 front and 13.00 - 24 rear tires as standard. Front axle clearance is 25 in. The 330-H utilizes a heavy-duty constant mesh transmission with 8 forward speeds up to 23.6 mph. Creeper gears are available as low as 1/4 mph. The 4 reverse speeds range from 1.7 to 12.2 mph. Weights, with standard equipment, are 21,690 lb. with GM engine and 22,090 lb. with the Cummins. The engine is rubber-mounted to eliminate vibration to the frame, which is an all-welded, one piece unit, with the strength to use the full power of the engine. A wide range of optional equipment and accessories are available for use with this machine.

LeTourneau-Westinghouse Co., Peoria, Ill.

For more details circle 131 on Enclosed Return Postal Card.

Cement Cube Mold

A newly designed three-unit mold for making test samples of cement is now available from Soiltest, Inc., Chicago. The new forged bronze CT-60 mold is made in accordance with American Society for Testing Materials (ASTM) standard specifications reports the manufacturer. Two inch cube molds are used in forming compression test speci-



Soiltest's Cement Mold

mens of portland cement mortars, lime and gypsum.

Key features in the new mold design is the wide flange construction of the mold's top and base. This wide flange simplifies the striking of excess amounts of cement when the cubes are being prepared and gives greater stability to the mold in storage, preparation and curing. The sturdy flanges prevent warping of the mold during use.

Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill.

For more details circle 132 on Enclosed Return Postal Card.

Vibrating Conveyor

A new totally enclosed air-powered vibrating conveyor that is reported to eliminate contamination and dust when moving bulk materials has been announced by the Cleveland Vibrator Co.

Air cushioned for quiet operation, this vibratory driven tubular conveyor



Vibrating Conveyor

carries the material without chipping or crushing. Flow is started and stopped by a quick acting valve that can be regulated by adjusting the air supply pressure. Four coil springs provide support and isolate vibration from surrounding structures.

Wellman Co., 1405 E. 6th St., Cleveland 14, Ohio

For more details circle 133 on Enclosed Return Postal Card.

492 Ft. Culvert

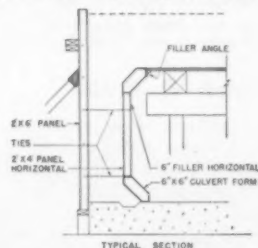


Symons Prefab Forms and Engineering Service

... Reduced by About 1/2 Material Needed for Job

How to extend an existing culvert 492 feet to allow Mercer Slough to pass under the new Seattle by-pass of U.S. Highway 99. Also, how to finish it before rains swell the slough, or creek, to over-flowing. That was the problem faced by A. R. Anderson Construction Company, Seattle.

Anderson used Symons Culvert Forms with Symons Steel-Ply Panels. Symons engineering and their Seattle man, Hal Caffee, designed a form lay-



out, so that inside wall and fillet forms could be stripped out without disturbing the shoring for the slab roof. This not only saved time but reduced by almost one-half, the material needed for the job.

The pay-off! It is estimated that it took under 200 man hours to set up and pour the job and under 60 man hours to strip the forms.

For the complete story on the *Seattle Culvert Job*, send in request on your company letterhead. Symons Steel-Ply Forms rented with purchase option.



SYMONS CLAMP & MFG. CO.
4283 Diversey Ave., Dept. A-1, Chicago 39, Ill.
Warehouses Thruout the U.S.A.

MORE SAVINGS FROM SYMONS

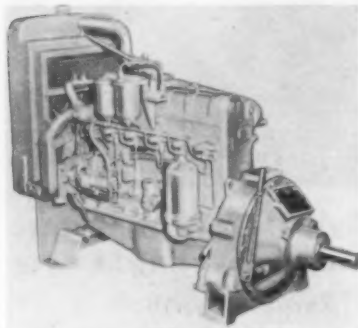
... for more details circle 326 on enclosed return postal card

New Products

Diesel Engines

Allis-Chalmers is now making available as a commercial engine its D-262 diesel engine which has been tested as the regular supply of power for its Model DD Motor Grader, the TL-10D and TL-12D rubber tired front-end tractor loaders.

The basic D-262 diesel develops 77



Allis-Chalmers D-262

hp. at 2200 rpm. Built at the company's Harvey (Ill.) works, the new engine has a $3\frac{7}{16} \times 4\frac{3}{8}$ bore and stroke and a 262 cu. in. piston displacement. It features replaceable "wet" type cylinder sleeves, full pressure lubrication, together with efficient air and oil filtering systems, which add up to long engine life. It has a 12-volt electric starting system.

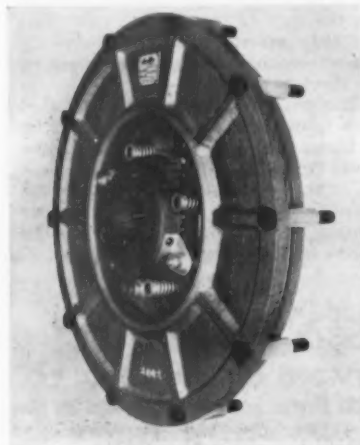
Allis-Chalmers, Tractor Group, Milwaukee, Wis.

For more details circle 134 on Enclosed Return Postal Card.

Air Clutch & Brake

A new concept in an industrial air clutch and brake designed with some new features has been announced by Mid-States Industrial Clutch Co.

Using silicone rubber diaphragms and fiberglass reinforcing for higher strength, the new device is reported adjustable, self-centering, and has few



Mid-State's Clutch

parts. The 16 and 18 in. type are now in production. The company states that a complete line from $8\frac{1}{2}$ in. to 36 in. will be available in the near future.

Mid-States Industrial Clutch Co., Inc., 6045 N. Broadway, Wichita, Kan.

For more details circle 135 on Enclosed Return Postal Card.

Alkaline-Solvent

A new alkaline-solvent compound designed to strip acrylic, alkyd and other resistant paint finishes has been announced by Oakite Products, Inc.

Called Oakite Stripper 150, the compound is said to remove even difficult paints in a simple soaking operation. It may be used in ordinary steel tanks and is safe on steel and magnesium and is inhibited against attack on aluminum, zinc and brass. It contains no phenolics.

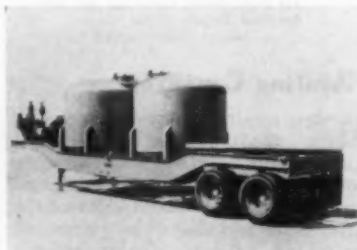
Oakite Products, Inc., 119 Rector St., New York 6, N. Y.

For more details circle 136 on Enclosed Return Postal Card.

Bulk Pneumatic Trailer

A new twin-tank dry bulk materials trailer equipped for self unloading by air has been introduced by the Heil Co., transport tank manufacturer at Milwaukee.

Because of a new pneumatic principle, the trailer unloads twice as fast as conventional units, up to 4000 lb. per min. through a 4 in. pipe. The new



Heil's "Jet-25"

principle involves the use of high pressure with low air volume. This makes the material flow through the unloading pipe in a "hi-density" condition. Featuring light weight and simplicity of design, the clean bore vessels of the "JET-25" discharge their materials cleanly and completely.

Heil Co., Milwaukee 1, Wis.

For more details circle 137 on Enclosed Return Postal Card.

Metal-To-Metal Surfacing

A new versatile and inexpensive metal-to-metal surfacing process has been introduced by Air Reduction. The new process is called Aircospray.

Designed expressly for hardfacing and brazing operations, the Aircospray concept permits powdered metals to be sprayed and fused simultaneously on a base metal by means of an oxy-acetylene flame. This makes the process well

suited for hardfacing operations—including deposition of powdered metals of a high melting point on a base metal of lower melting point—since alloys of greater hardness can be compounded in powdered form than in standard rod form. It can be utilized on such parts as pistons, valves, saw blade guides and any other sliding surfaces on engines, pumps and other machinery.

Airco Co. International, 150 E. 42nd St., New York 17, N.Y.

For more details circle 138 on Enclosed Return Postal Card.

Boom Warning Device

A new transistorized sigalarm engineered to provide a dependable means of warning personnel near a working boom of dangerous contact with overhead wires has been announced by Wintronics.

The alarm circuits are actuated by the electrostatic field that surrounds all live power lines. Pre-set range can be



Transistorized Sigalarm

set from one foot to several hundred feet depending upon the voltage of the power lines which need not be known. The device is reported to protect the entire length of the boom. If the sensor fails an interlock unit causes an alarm. The unit is about 6 by 9 by $2\frac{1}{2}$ in. in size.

Wintronics, 213 S. Hawthorne Blvd., Hawthorne, Calif.

For more details circle 139 on Enclosed Return Postal Card.

Multiple Luminaire

A new multiple luminaire for area lighting has been introduced by Revere Electric Mfg. Co.

Two units are offered. The No. 5452 Quad-Oval is furnished with 4 No. 2284 Endovals using 400 watt mercury lamps. The No. 5433 Quad-Oval is furnished with 4 Revere No. 2502-B250 Urban-ovals that will accommodate a 100, 175 or 250 watt mercury lamp. The pole-top adapter for each unit is a sturdy aluminum alloy casting that slips 3 in.



Revere's Multiple Luminaires

pipe and is securely held with 4 pointed combination set and leveling screws. A removable cover is provided on top for ease of wiring.

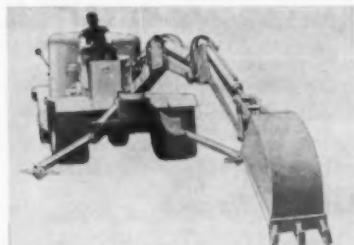
Revere Electric Mfg. Co., 7420 Lehigh Ave., Chicago 48, Ill.

For more details circle 140 on Enclosed Return Postal Card.

Hydro-Trencher

A 3/4 yd. class hydro-trencher has been announced by Ware Machine Works, Inc. The unit develops 38,000 lb. of dipper stick digging effort and has a digging reach of 19 ft., depth of 12 ft. 9 in. Clear dumping height is 11 ft. 11 in. at a reach of 13 ft. 5 in.; specifications vary with height of carrier.

Standard power unit for the trencher is an industrial type 42 hp, 4 cylinder, overhead valve gasoline engine. Lifting capacity at full radius is 2,200 lb.



Ware 600 TM Hydro-Trencher

Buckets include replaceable manganese tooth points and are available in 12 to 36 in. widths. Safety features include full vision operator position offset to left of swing turret to eliminate blind spots. Patented boom cushioning is included which is said to absorb shock, provide flow control to prevent cylinder lag and permit inching of heavy loads with positive control. Also included are a 265 deg heavy duty chain swing to facilitate working in cramped areas and a camel back boom with in-line cylinders placed directly over it.

Ware Machine Works, Inc., Ware, Mass.

For more details circle 141 on Enclosed Return Postal Card.

Engine Generators

A new balanced power Winco Engine



Winco Engine Generators

Generator has just been announced by Wincharger Corp.

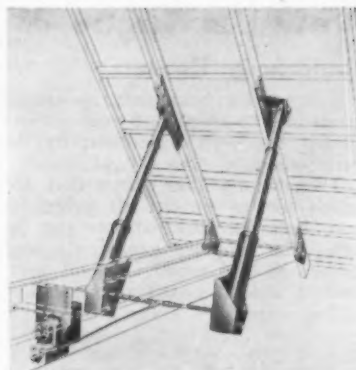
Powered by a Wisconsin VH4D air-cooled gasoline engine, these new Winco's are rated at 12,000 watts A.C., and are equipped for remote starting. The new Winco series also features the exclusive Maxi-Watt Power Control which gives maximum power for unusually heavy motor loads, maximum efficiency for normal loads. Tests prove that this 12,000 watt balanced Power Winco Engine Generator will carry such loads as a 5 hp. motor, plus 6000 watts of simultaneous resistive load, reports the manufacturer.

Wincharger Corp., East 7th & Division St., Sioux City, Iowa

For more details circle 142 on Enclosed Return Postal Card.

Duo-Scopic Conversion Hoist

An outside mount, two-stage duo-



Galion Duo-Scopic Hoist

scopic conversion hoist package has been added to the line of Galion All-steel Body Company.

The unit is said to be easily mounted directly on the truck frame without the use of a subframe. The unit is adaptable to any wood, steel platform or stake body frame. Body platform lengths of 11 to 13 1/2 ft. and cab to axle dimensions of 84 to 102 in. are recommended. The units have a 45-in. stroke providing a 45 deg. dump angle. Gvw range is 10,000 to 19,500 lb. Payload rating is to 14 tons depending on body length and pivot. Base sleeve diameter is 4 in., and diameters of the active sleeves are 3 in. and 2 in. A built-in pressure relief valve and bronze wear plates in the pump assure minimum maintenance, maker reports.

Galion Allsteel Body Company, Galion, Ohio

For more details circle 143 on Enclosed Return Postal Card.



Jaeger pays off with 600 cfm at 1700 rpm

This Jaeger rotary compressor, powered with the same GM 6-71 diesel used in other makes, produces 600 cfm of air with 100 fewer revolutions (1700 rpm instead of 1800), consuming less than 1 1/4 lbs. of fuel. Think of the long-term saving in fuel, and engine and compressor life. Other Jaeger sizes are comparably efficient. See your Jaeger distributor, or send for Catalog.

The Jaeger Machine Company, 223 Dublin Ave., Columbus 16, Ohio

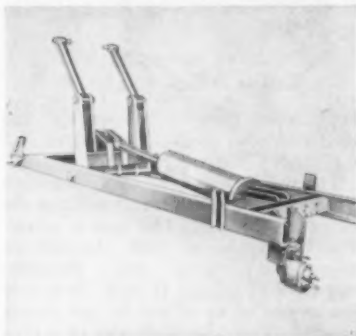
... for more details circle 306 on enclosed return postal card

New Products

Underbody Hoists

A new line of heavy-duty, underbody hoists in both single and twin-cylinder models has been introduced by the Perfection Steel Body Co., of Ohio.

The manufacturer states that the fullest use of forward-lift principles have been incorporated into the design. The lift-point has been moved forward to load center. The oil reservoir of welded boxed channel steel



Perfection Underbody Hoists

extends the entire width of the hoist frame, doubly reinforcing the sub-frame at this point and forming a solid member, giving added payload to the truck. The single-cylinder hoists are furnished in either 7 or 8 in. dia. with a 25 in. stroke. The twin-cylinder hoists are furnished in 6, 7 or 8 in. cylinder diameter.

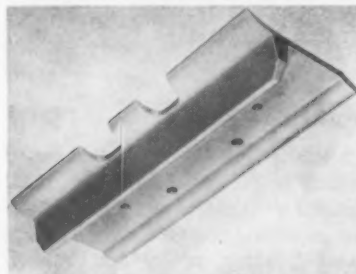
Perfection Steel Body Co., Galion, Ohio

For more details circle 144 on Enclosed Return Postal Card.

Impact Resistant Grouser

A new grouser shoe has been announced by WesTrac Co. manufacturers of replacement parts for crawler tractors.

Increased beam strength, assisted through added steel to the rear of the grouser and added steel in the lower base section of the grouser lug, enables this new shoe to withstand more severe impacts without damage from breaking or bending. Impact resistance is further multiplied by a specially-developed heat-treat process culminating in high frequency electric induction tempering. The shoe, rolled of special alloy steel, is completely interchangeable with the



WesTrac's Grouser Shoe

original equipment and may be used in complete groups or intermixed with any interchangeable grouser shoes.

WesTrac Co., Dept. G., 1309 W. Sepulveda Blvd. Torrance, Calif.

For more details circle 145 on Enclosed Return Postal Card.

Clamshell Backhoe Attachment

The Parsons-Shawnee 88C Hydro-Clam, a backhoe attachment for utility tractors designed for spot excavations has been announced by the Parsons Co.

The unit is available with 24, 30 and 36-in. wide buckets and features 10,000-lb. breakout, 3,000-lb. lift capacity, 12



Parsons-Shawnee Hydro-Clam

ft. digging depth and 9-ft. 9 in. dumping height. Bowls operate independently or simultaneously to produce smooth sides and level floors, the manufacturer states. High breakout pressure of clam bowls is said to result in trim, square corners. Entire assembly can be attached or detached from boom in minutes.

Parsons Co. Newton, Iowa

For more details circle 146 on Enclosed Return Postal Card.

Air Line Oilers

Two models of air line oilers built for heavy duty field service have been announced by the Gardner-Denver Co.

Models LO-30 and LO-50 are large reservoir line oilers having 3 and 5 gal. capacity respectively. They are especially designed for use with heavy equipment; large drills, tunnel jumbos, and large rigs. These extra large capacity air line oilers provide longer constant operation of equipment without attention to refilling the oiler. The wide range of air capacity makes them ideal for use with one or more drills. The LO-30, 3 gal. oiler, operates within



Gardner-Denver Oiler

ranges of 175 to 600 cfm. The LO-50 5 gal. capacity operates in the 200 to 800 cfm range.

Gardner-Denver Co., Quincy, Ill.

For more details circle 147 on Enclosed Return Postal Card.

Front End Loader

The new model Lorain ML-309 front end loader has been announced by Thew Shovel Company, the third model in their Moto-Loader series of rubber tire, 4-wheel drive front end loaders.

The unit has a lifting capacity of 18,000 lb. and features one foot control of both forward and reverse travel speed allowing both hands to be free



Lorain ML-309 Loader

for other operations. The unit is powered by a Cummins diesel engine and has torque converter, planetary axles, power shift transmission, power steering and power brakes. Frame of the loader is a one-piece, all-welded unit with a solid panel forming the front and sides of the frame. Lift arms are connected to each other to form a rigid, single-piece weldment that is attached to the frame.

The Thew Shovel Co., Lorain, Ohio

For more details circle 148 on Enclosed Return Postal Card.

Ratchet Wrench

Hinged handles and detachable handles add to the industrial versatility of Lowell Ratchet Wrenches, reports the manufacturer, Lowell Wrench Company.

In operation, the hinged handle allows fast hand-cranking combined with extra handle length for final tightening. When not in use, it folds into a compact unit for storage. Detachable handles either threaded or pinned can be quickly removed to fit into a kit for on the job adaptability. The pipe handle extension can be bent to any desired shape in an ordinary pipe bender.

Lowell Wrench Co., Worcester 4, Mass.

For more details circle 149 on Enclosed Return Postal Card.

Front End Loader

A new front end loader for the Hi-Lifter, utilizing a 1 cu. yd. bucket, was

announced by Kwik-Mix. The machine digs 8 ft. wide and quickly converts to



Kwik-Mix Loader

a fork lift. The entire operating mechanism pivots ahead of the operator. The new machine has a dumping height of 8½ ft. and a reach of over 5 ft.

Kwik-Mix Co., Port Washington, Wis.

For more details circle 150 on Enclosed Return Postal Card.

Electric Sign

A new type of electric sign that is reported to remain lighted even after it has been punctured by shotgun pellets or rifle bullets was displayed recently by Sylvania Electric Products Inc.

The new signs for indoor and outdoor use incorporates Panelescent lighting for letters, numbers and areas. The use of Panelescent lamps, a thin, phosphor-coated metal sheet, makes it pos-

sible to construct lighted signs less than one in. thick. To protect the lamps that form the characters and background of the sign, a technique has been developed in which the Panelescent is embedded in plastic in a metal tray. These lamps are reputed to operate for more than five years without maintenance problems and with a low power consumption.

Sylvania Electric Prod. Co., 730 Third Ave., New York 17, N. Y.

For more details circle 151 on Enclosed Return Postal Card.

New Backhoe

A new backhoe with a 15 ft. digging depth was announced by Parsons-Shawnee. Designated the 1500 Backhoe, it features bucket widths of 24,



Shawnee-Parsons Backhoe

30 and 36 in. The bucket cylinders are fully enclosed and equipped with micro-honed cylinder cases and high carbon steel ground and polished cylinder rods.

Parsons Co., Newton, Iowa

For more details circle 152 on Enclosed Return Postal Card.

Straddle Trailer

The new "Straddle Trailer", states the manufacturer, with its own hydraulic system, "picks up" the load—holds it secure while travelling—and "unloads" at the job site. The complete load-haul-unload cycle is handled by one man and the models now in full production can haul up to 40,000 lb. payloads.

The plant or dock foreman has the load stacked on pallets or common wood blocks. The driver backs the trailer over the load. At the touch of a lever, the trailer picks up the load, pallets and all, and automatically centers it as it is raised to transport position. To unload, the drive stops at the unloading site, lowers the load, and drives the trailer away from the load.

Challenge-Cook Bros., Inc., 3334 San Fernando Rd., Los Angeles, Calif.

For more details circle 153 on Enclosed Return Postal Card.

DON'T THROW AWAY CRACKED DIESEL CYLINDER HEADS

You can save 50% of replacement cost with Factory Rebuilt Swick-Guth Heads. Swick-Guth restores cracked or worn heads, blocks, transmission cases to a Guaranteed good as new condition by the Controlled Heat Process . . . successfully used for more than a Quarter Century.

GUARANTEED TO YOUR SATISFACTION



Send today for price list and a free booklet on the famous Swick-Guth Process, and the name of the dealer nearest you.

SWICK-GUTH CO.
MAMERSON KANSAS • FORMERLY GUTH CO.

"SPECIALISTS IN WELDING"



"DIESEL CASTINGS"

... for more details circle 325 on enclosed return postal card
ROADS AND STREETS, January, 1961



TARCO Dump Body HOPPERS for Straight De-icing Salts

"Watchman" Hoppers have no moving parts. Bulk de-icing salts flow by gravity into the spreader. Travel and spread with the dump body in the normal "down" position.

There are two sizes for dump bodies: 3 or 5 cu. yd. . . enough salt for 25 miles. The "Scotchman" spreader used is a standard unit equipped with a Type V-3 Electric Cab Control which provides for one man operation. Install or remove the "Watchman"- "Scotchman" combination in less than 20 minutes.

See your "Scotchman" Dealer for liberal trade-in allowances.

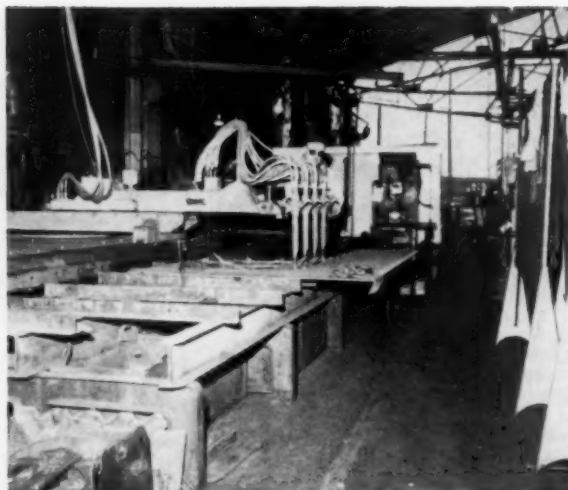
TARRANT MFG. CO.

25 Jumel Place, Saratoga Springs, N. Y.

... for more details circle 330 on enclosed return postal card



Twenty-four hours after Frink's factory fire, rebuilding gets under way.



Forty-eight hours after the fire, plant operator is at work on newly installed torch cutting equipment for a restart of production.

Frink Met Snow Plow Orders Despite Fire

A disastrous fire at the Frink Sno-Plow factory in Clayton, New York, hardly daunted that company's organization in spite of the severe damage caused. With co-operation from dealers, employees and suppliers the company began turning out plows almost as usual

within three days. Frink was able to meet all current and anticipated orders for 1960-61.

According to George W. Kenyon, company president, a volunteer fire fighter saved 1,600 vital engineering drawings, by standing for hours on an adjoining roof and playing a hose on safe's location. One dealer sent Frink an unsolicited check for

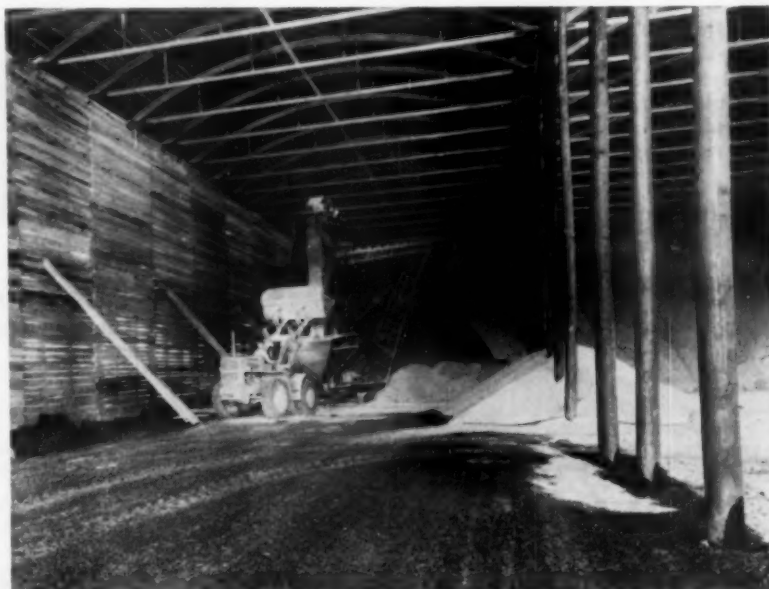
\$50,000 with the remark, "use this where it will do the most good." And a supplier met a request for specialized steel tubing.

This cooperative effort by everyone concerned, said Mr. Kenyon, meant a return to full production within 30 days, rapid repair of the plant and an actual expansion of Frank's physical facilities.

Big 'Barn' Built for Highway Salt

This wood-pole framed building at Myers, N.Y., is the Cayuga Rock Salt Company's answer to the problem of storing salt for better customer de-icing service in the winter season. The chemical and damp resistant poles were pressure-treated in a Koppers Company plant. Also Koppers' salt-immune bituminous macadam was used for the 60,800 sq. ft. inside floor area.

Knight Paving Products Division of Koppers Company also installed the bituminous flooring, covering layers of No. 3 and No. 2 stone each with a penetration macadam liquid and the final layer of No. 1 stone with a modified bituminous emulsion. The "barn" can store 70,000 tons of rock salt.



Mountains of highway salt begin accumulating in huge Cayuga pole-barn, awaiting use by counties and cities in the Northeast.

Manufacturers' Literature

CRANE CATALOG: A new catalog has just been published by Manitowoc Engineering Corp., Manitowoc, Wis., describing the Model 4000 Lift Crane which has a capacity of 125 tons at a 17 ft. radius.

Some of the outstanding features are a heavy, massive rotating base with huge hook and house rollers; a big, stable undercarriage; and long, wide-spread crawlers. Without extensive advance preparations or dismantling, the unit can be put on a standard RR flat car for fast moves between jobs.

Crane has torque converter, double drum boom hoist of the self-locking worm gear type, disc-type swingers self-removing counterweight, manual or air controls.

For more details circle 157 on Enclosed Return Postal Card.

TORQUE MANUAL: A 3rd and completely revised torque manual containing 31 pgs. of application illustrations, bolt charts, and discussions on assembly characteristics has been issued by the Sturtevant Co., Addison, Ill.

Instructions or properly caring for a torque wrench and suggestions for making on-the-spot adjustments and repairs are included with illustrations and explanations on using a torque wrench correctly. There is a section on

the torque law, correct nomenclature and an explanation of the torque wrench itself.

For more details circle 158 on Enclosed Return Postal Card.

CONSERVATION BULLETIN: A new 8 pg. bulletin discussing and illustrating the Bantam method in land and water conservation programs has been released by Schield Bantam Co., Waverly, Iowa.

Covered in the bulletin is the Bantam Model C-350 crawler-mounted crane excavator. Included are illustrations and a discussion of the features which are found on the Model C 350 Bantam and its method of drainage and irrigation. Wide base undercarriage and V type backhoe attachment are discussed and illustrated. Also covered in the bulletin is the carrier-mounted Model T 350 Bantam and the six different Bantam built crane carriers.

For more details circle 159 on Enclosed Return Postal Card.

NEW PUMPS: Pumps designed to permit control and regulation of large volumes of water is the subject of a newly issued bulletin by Peerless Pump, Food

Machinery and Chemical Co., 301 West Avenue 26, Los Angeles 31, Calif.

Tradenamed the "Hydro-Foil", these pumps are available in two types—one, an axial flow propellor type pump and the other, a mixed flow type pump. Both are available in single or multi stage designs. These pumps are said to be capable of handling up to 220,000 gpm, with lifts ranging from 2 to 60 ft.

For more details circle 160 on Enclosed Return Postal Card.

FLEXIBLE HOSE: A new 20 pg. catalog, No. ID-100D, pictorially describing Universal All Metal Flexible hose to convey gases, solids and fluids; for vibration control; and to compensate for motion or misalignment under high temperatures, pressure, vacuum or abrasive conditions, has been released by Universal Metal Hose Co., 2133 S. Kedzie, Chicago 23, Ill.

Detailed descriptions, specifications, and applications use together with coupling recommendations are given for the Universal U 200 and U 250 Series for conveying searching gases and fluids. Also included in the new catalog are Universal general purpose industrial hose, U 150 Series, suited for tank car unloading service of hot tar

LOOK FOR FUNK

reversomatic

DRIVES

on the equipment you buy!





Draglines and Cranes

Hoisting Equipment

Industrial Locomotives

FUNK MFG. CO.

P.O. Box 577-H
COFFEYVILLE,
KAN.

Get smooth, instant power shifting—both forward and reverse, or lift and lower—with JUST ONE LEVER.



Power Shovels



Earth Movers



Road Rollers

You don't have to be a Monkey—

... to loosen frozen bolts on utility poles. The new Aerosol Kroil, which can be squirted with one finger, loosens the most stubborn frozen metal parts...FAST.

More than 18,000 shops depend on Kroil whenever frozen metal parts threaten to tie up production or waste manhours. In this new package it is the finest rust-busting tool ever...shoots a stream 3 ft. yet won't leak. One customer said, "before trying Kroil we broke off every nut (on our heat treat trolleys), since then we have not lost one and have decreased the repairing time from 30 minutes to about 6 minutes per trolley."

KANO KROIL LOOSENS FROZEN METAL PARTS



Use Kroil on all dismantling jobs; for filing, sawing, honing; ... also keeps air driven tools running freely.

Just try Kroil on a make good basis. Case of 12 Aerosol Kroil 12 ounce cans \$18.75 f.o.b. factory or send \$2.00 for one can postpaid. If it doesn't perform to suit you, return the empty can for refund.

KANO LABORATORIES

1061 Thompson Lane
Nashville 11, Tenn.

... for more details circle 307 on enclosed return postal card

... for more details circle 296 on enclosed return postal card
ROADS AND STREETS, January, 1961

and asphalt, fuel oils, and other non-searching fluids; "Steelflex" standard, light, medium, heavy and superweight galvanized steel and all metal flexible exhaust and blower tubings.

For more details circle 161 on Enclosed Return Postal Card.

BELT LACING: A new circular of the latest belt lacing equipment and materials is now available from the Clipper Belt Lacer Co., 101 Garden St., Grand Rapids 2, Mich. The pocket size folder contains descriptions and prices of the various belt hooks, lacers, and cutters manufactured.

Information on new special purpose belt hooks of stainless steel, rust proof (monel), and phosphor bronze is included for the first time on the back page of the brochure. The actual sizes and uses of all the hooks are shown. Each lacer model available, from the speed lacer to portable lacers to vise lacers, are depicted in this booklet. A new conveyor corrugator belt lacer is also shown. Information on both the 6 and 10 in. Clipper belt cutters has also been included.

For more details circle 162 on Enclosed Return Postal Card.

SPEED REDUCER: "Parallel Shaft Speed Reducers", a new 36 pg. book (2719), describes Link-Belt's completely redesigned and expanded line of "balanced design" parallel shaft reducers in 57 sizes, including 23 new sizes.

Single, double, and triple reduction units are available in capacities up to 2,800 h.p. at high or low output speeds, and ratios up to 292:1.

Book 2719 available from Link-Belt, Prudential Plaza, Chicago 1, Ill., describes the complete line and includes full information for selecting the correct drive for every application. Sixteen pages of rating tables contain thermal and mechanical horsepower ratings for each input and output speed. Load classes are shown for almost 250 driven machines. Overhung loads, extended shafts and outboard bearings, dimensions and actual ratios are included in additional tables.

For more details circle 163 on Enclosed Return Postal Card.

PORTABLE HEATERS: A new piece of literature that describes an entire line of oil fired heaters and gas fired salamanders has been released by Aeroil Products Co., Inc., 69 Wesley Street, South Hackensack, New Jersey.

The complete line of heaters are portable and may be used wherever temporary heat is required.

For more details circle 164 on Enclosed Return Postal Card.

MACHINERY CATALOG: The availability of a catalog illustrating and describing the new American 900 Series crawler crane-excavator has been announced by the American Hoist & Derrick Co., 63 S. Robert, St. Paul, Minn.

The new air-controlled American 900 is in the 3½ to 4½ cu. yd. class, has a rated lifting capacity of 110 tons, and is capable of handling boom lengths to 270 ft. plus jibs. The new machine has an 18 in. ground clearance. Transporting is reported easy through the removal of four bolts to remove the side frame.

For more details circle 165 on Enclosed Return Postal Card.

PUMPS/VALVES: Gear pumps, control valves, and motors, and their application on mobile equipment and production machinery, are the subjects of a new general bulletin released by Hydreco, The New York Air Brake Co., 9000 E. Michigan, Kalamazoo, Mich.

The 8 pg. bulletin contains photographs and cutaway drawings illustrating the construction and design features of each of the various components. Also described in detail are the construction features incorporated in Hydreco pumps and motors.

For more details circle 166 on Enclosed Return Postal Card.

STABILIZATION: A new booklet published by American-Marietta Co., Milwaukee, 1, Wis., has been announced. Entitled "Gravel, slag and stone . . .", a 6 pg. booklet, it explains how these basic materials can be transformed through stabilization into low-cost, maintenance-free roads. Fully illustrated text outlines three methods of stabilization techniques.

For more details circle 167 on Enclosed Return Postal Card.

CLUTCH PLATE FACINGS: A new illustrated bulletin, descriptive of Velvetouch Feramic clutch plates and facings, has been announced by the S. K. Wellman Co., 200 Egbert Rd., Bedford, Ohio.

Feature in the brochure is a complete explanation of how plates and facings are made and where they are used. The plates are said to be reliable for all types of construction machinery, earth-moving equipment and trucks.

For more details circle 168 on Enclosed Return Postal Card.

INGRAM

ROLLERS



FOR RENT

NEW

INGRAM ROLLERS

5 to 12 TONS

TANDEM AND 3-WHEEL

FEATURING . . .

REVERS-O-MATIC DRIVE

Acme IRON WORKS

CULLEA AVE. AT EXPRESSWAY N.W.
P.O. BOX 3026 • SAN ANTONIO 6, TEXAS

ROTARY SWEEPER BROOMS

WE MANUFACTURE

- Austin - Western
- Cut Law Bay
- Det-Harvester
- Fordson
- Ferguson
- Green
- Gutternipe
- Hough
- Huber
- Jeep-Willy's
- Littleford
- Little Giant



- Melt (M.S.)
- Stumberg
- Ram
- Resco
- Spearwell
- Tampa
- Wayne
- Model 450
- And Many Others

Special Core made to order

• COCOA ROLLER MATS •

Drag Broom Levelers **RE** FILLING

Street Push-Concrete **B**UILDING

KENNEDY'S Brooms **PAIRS**

VAN BRUSH MFG. CO.

2728 McGee Trlwy. Kansas City, Mo.

For Sale Complete Crushing Spread

Consisting of:

30' x 42" Pioneer feeder.
32 x 40 Cedarapids jaw crusher.
30 x 42 Cedarapids Impactor
secondary w/5' x 14' 3-deck
screen.

Northwest 80-D Shovel ser. no.
20548.

Cat. D7 dozer ser. no. 17A-14586.

3 Mack Model LRX quarry trucks.

G-D 600 c.f.m. air comp.

G-D Air Trac drill.

G-D Air motor.

Damco Blastholer rotary drill.

Location near Huntsville, Texas

MILLER C. BEASLEY MACHINERY CO.

2237 W. Northwest Hwy.

3/4 Mi. W. of Circle on
Grapevine Hwy.

P. O. Box 5266

Phone: FI 7-8325

Night: RI 2-6101

Dallas, Texas

NEED EQUIPMENT? "WE HAVE IT"

USED CONSTRUCTION EQUIPMENT

ALL MAKES AND TYPES

WESTPORT MACHINERY CO.

1801 Cherry Hill Road

Baltimore 30, Md.

Phone: MULberry 5-0402

W. F. Rippel, President

Home Phone
HO 7-9931

NOW! Get Circulation Where It Counts . . . Roads and Streets' Clearing House REACHES THE MARKET'S HEART

INDIVIDUAL CONTRACTORS
CITY, COUNTY ENGINEERS
CITY, COUNTY OFFICIALS

Long a leader serving the heavy construction and associated fields, **ROADS AND STREETS'** "cream" circulation goes to the important men in the business. They are the men, who directly or indirectly influence the purchase and sales of new and used equipment and supplies.

When you are "in the market" reach the logical buyer or seller quickly—at a reasonable cost to yourself.

Use the Clearing House!

Just clip the coupon below and attach your copy.

CLIP YOUR AD COPY TO THIS HANDY ORDER FORM AND MAIL TO

EXPANSION

of
CONTRACTOR ACTIVITIES
PROVIDES
OPPORTUNITY

for
INVESTOR PARTICIPATION
IN DOMESTIC AND FOREIGN
WORK 1% PER MONTH MIN.
GUARANTEED RETURN ON
\$100,000 Secured Investment

WRITE or PHONE
NORMAN S. BROOKE, Vice-President

Guardian Trust Company
MONTREAL, CANADA
Victor 2-8251

CLEARING HOUSE SECTION ADVERTISING RATES

TRANSIENT RATE — \$11.00
Per Column Inch Per Insertion
CONTRACT RATES — Based on
use of total space indicated within
yearly period.

12 in.....	\$10.45
24 in.....	10.35
36 in.....	10.00
48 in.....	9.90
60 in.....	9.80
90 in.....	9.65
120 in.....	9.50
180 in.....	9.25
360 in.....	9.00

COPY AND CLOSING DATES

Final closing date is the Fifteenth
of the preceding month. Maga-
zine is issued 1st of publication
month. If proof is desired, copy
must be received 5 days preceding
closing date.

CLEARING HOUSE SECTION ROADS AND STREETS

22 W. MAPLE STREET, CHICAGO 10, ILL.

Please Insert the Attached Advertising Copy in the Next Issue
of **ROADS AND STREETS** to Occupy _____ Inches of Space.

Number of Insertions _____

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

TELL US WHAT YOU HAVE TO OFFER
AND WE'LL SET UP THE AD FOR YOU.

CLEARING HOUSE SECTION

BIG DOUBLE AND TRIPLE-DECK SCREENS GIVE HIGH CAPACITIES ON KOLMAN 101 PLANTS



48"x10' Kolman triple-deck screen on 50"x42" Kolman Model 101

Get Multiple Separations With a Portable Plant

With either a double or triple-deck screen on a KOLMAN Model 101 Portable Conveyor-Screen Plant it is easy to make several sizes of material at one time. The plant has also proved ideal for scalping out oversize and rejected fines in a single operation. With the top deck removing oversize, the capacity of decks for screening fine material is increased. All this on a portable outfit.

Kolman Screens, designed to eliminate all weight, are ideal for conveyor installations. Their "floating action" avoids transmitting vibrations to the conveyor.

Write for Literature
KOLMAN MFG CO.

5200 W. 12th Sioux Falls, S. D.

KOLMAN
COMPLETELY PORTABLE
CONVEYOR-SCREEN PLANT
CONVEYOR - SCREEN - TRAIL - FEEDER



Above, 5' x 12' double-deck screen on Kolman 101.

Left, two 5'x12' single-deck Kolman screens were mounted on 60'x42' 101 conveyors to produce over 2,000 t.p.h. of minus 1 1/2" base course gravel.

FOR SALE

COMPLETE PORTABLE CRUSHING UNIT

AVERAGE AGE: 3 YEARS

CONSISTS OF THE FOLLOWING ITEMS:

- 3' Symons Nordberg cone w/Roots Vane standard type blower w/3 H.P. motor. 125 H.P. A.C. electric motor. 4x12 Cedar Rapids doubledeck vibrating screen w/15 H.P. electric motor. 24' x 36' conveyor w/H.P. motor. With oil compensator starter. Above mounted on heavy duty tandem trailer.
- 22 x 36 jaw crusher w/100 H.P. electric motor w/oil compensator starter. 30' of 30" conveyor w/7 1/2 H.P. gear head elec. motor mounted on H.D. tandem trailer.
- 40 x 24 Cedar Rapids Rolls w/100 H.P. electric motor w/oil compensator starter.
- 4 x 12 double-deck Cedar Rapids screen, 15 H.P. electric motor. 25' of 30" conveyor w/7 1/2 H.P. electric motor w/Dodge shaft mounted drive. Mounted on H.D. Tandem Trailer.
- 20-yard portable Hopper w/30' of 30" conveyor. 20 H.P. electric motor w/Falk shaft mounted drive.
- Caterpillar D-397 diesel generator, carbon pile regulator. Complete with all necessary electrical wiring.
- 1946 Chevrolet van truck with miscellaneous switch boxes, etc., plus numerous other incidentals.

MAY BE SEEN AT LEWISTON PRE-MIX CONCRETE, INC., GARAGE

LEWISTON PRE-MIX CONCRETE INC.

SHAKE RIVER AVENUE
LEWISTON, IDAHO

DAYS SH. 3-3333

NITES SH. 3-8203

LOADERS

Hough HL-D
Pettibone 125A
International TD14
Haise 75W

1 Yd. Bucket, good tires. \$1,750.
1 1/2 Yd., gas power, rebuilt.
2 Yd., rebuilt engine, new tracks.
Bucket loader, on pneumatics.

HOES - DRAGLINES

Insley K-12
Link Belt LS51
Lorain TL25K
Schild Bantam M49

Trench Hoe, gas power.
Shovel, 1/2 yd. hydraulic.
Dragline 3/4 Yd. Cat.
Hoe-Drag, GMC 6x6 (4).

EIGHMY EQUIPMENT COMPANY

Pierpont at W. State St.

ROCKFORD, ILLINOIS

WO 4-6706

"LIQUIDATION SALE" STRIPPING EQUIPMENT

- PGH 1055 dragline.
- Worthington 105 cu. ft. compressor.
- 22B Bucyrus shovel.
- 803 Lima shovel.
- 93M Marion shovel with \$10,000 in parts.
- HD-21 tractor.
- Bay City 650, 1 1/4 yd. drag.
- Schram Rotary drills.
- McCart. var. drl. on 2 T. Fed. tk.
- L80 Lorain 1 1/2 yd. dragline.
- Hobart 300 amp. welder.
- Model 8 Northwest dragline.
- "D" Roadster Tournapull.
- TL-25J Lorain 3/4 yd. & 3/4 yd. Lima.
- Hardsog Horizontal drill.
- Haise loaders Model 75W.
- Wagon drills.
- 3/4, 3 1/2 & 6 yd. dragline bucket & 3/4 yd. clamshell.
- 200W draglines 7 yd.
- Page dragline 7 yd. & 2-760B with 17 yd. buckets.
- D-7 & D-8 Caterpillars and 1 Oliver FD.
- Low Boy & D-4 tractor.
- Compton-augers Model 48 & 56.
- 10W, 14 yd. bucket.
- 93M Marion Dragline 3 1/4 yd. bucket.
- 111M Marion 3 1/2 yd. shovel.
- #362 Marion 2 1/2 yd. shovel.
- Jack Hammers.
- 10 ton Gallon rollers.
- #1005 Koehring 2 1/2 yd. shovel.
- 1201 Lima 3 1/2 yd. shovel.
- 20 yd. Garwood scraper.

SCALES

- 20', 25' & 35' truck scales.
- set 40 ft. scales (55,000 lb.)
- set scales for weighing trip cars.
- set r.r. scales (200,000 lb. cap.)
- 75 ton 56'x12' truck scales.

CRUSHERS

- 24x36 McNally double & Sgl. roll.
- McNally pick breakers.
- 24x42 McClanahan & Stone D/Roll.
- 60x36 McNally.
- 24x36 Bonded scale D/Roll (new rolls).
- 36x48 McNally D/Roll.
- Bradford breaker 7x14' & 9x14'.
- 24x36 jaw crusher.
- 36x10 Pennsylvania hammermill.

Other Eqt. also avail.

Belts & Conveyors, Compressors,
Copper, Transformers, Motors,
Pumps, Roll, Vibrators,
Electrical Supplies.

Mine Equipment & Supply Co.
Box 93 Madisonville, Ky.
Phone: TA 1-2644 & TA 1-2646

Concrete Re-Mix Plant

Noble 150 ton complete. Modern Eqt. Surplus to Alaska Lumber & Pulp Corp. Plant includes all facilities from the bottom end of the aggregate incline conveyors through complete re-mixing cycle, also cement handling & storage facilities as follows: 235' 24" aggregate incline conveyor, 4' x 12 three deck screen, 150 ton 4 compartment plant aggregate bin, 2 cu. yd. weigh hopper, 2 cu. yd. Smith mixer (tilting), 4 cu. yd. gab hopper, 50 HP boiler, 78 HP total in electric motors, cement rehandle screw and bucket conveyor, 500 barrel cement storage silo, air compressor, and misc. additional accessories. (Plant located in Sitka, Alaska, prices quoted FOB Seattle)

EVERYTHING MUST GO—NO REASON- ABLE OFFER REFUSED

CEMENT SYSTEM—Fuller Kenyon 6", 40 HP., 150 bbls. per hr., 75 HP. air compressor, complete w/5" rubber cement transport hose, 3" rubber cement transport hose, 5" transport pipe, 5" 6' radius pipe bends.

(3) **AIR COMPRESSORS**—Joy, Stationary, Class WL80, Mod. 50-E, 230 CFM, w/50 HP. 220/440 V 3 phase motor, new in 1958.

CONCRETE BUGGIES—Prime mover. Mod. 15-A.

BUCKET, 2 1/2 C.Y. Esco.

BUCK HOISTOWER, 15 H.P., motor, Port. TRACTOR EXCAVATOR—Model 630 Eimco, Air Operated.

DRILL JUMBO—Gardner-Denver w/2 Hyd. Booms.

LOCOMOTIVES—4-ton Battery.

MINE CARS, 4 1/2 ton, Granby.

Exclusive Selling Agent

PANAMA MACHINERY MU 2-2090
P. O. Box 3645—Seattle 24, Washington

3-10'x78" Dryers—2'3'4'5'1/2'7' Symons and
 Teis Smith Cone Crushers—3648-4042-4872 Jaw
 Crushers and smaller sizes—48" Gyratory & 20"
 Gyratory Vibrating Feeders—other types of
 Feeders—Eagle Fine & Coarse Material Washers
 —Dixie Non Clog moving plate Hammermills—
 Asphalt Plants—Jaw—Cone—Gyratory—Roll
 Double and Triple—Hammermill and Impact
 Crushers—Ball—Rod—Tube Mills—Screening,
 Washing and Crushing Plants, Classifiers, Com-
 pressors, Conveyors, Cranes, Drills, Dump Cars,
 Dredges, Feeders, Hoists, Motors, Generators,
 Kilns, Dryers, Locomotives, Pumps, Screens,
 Shovels, Draglines, Transformers, Euclid Trucks.

STANLEY B. TROYER EQUIPMENT CO.
 Box 97 Phone 500 Crosby, Minnesota

FOR SALE
One 1952 Used
International Harvester
Model TD9 Crawler Tractor

With standard equipment including
 Hough loader.

Price\$5,000.00
 Terms can be arranged

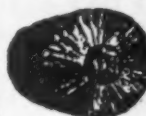
PHILLIP E. FREED
 38 S. Dearborn St. Chicago, Ill.
 Phone: STate 2-7032

CLEARING HOUSE SECTION

"BRUSH-UP" on BRUSHES

at DALLAS BRUSH!

Call "Mr. Van" — The
 Friendly Brush Man for
 NEW Specifications and
 New Low Prices.



Rotary Sweeper Broom Cores
 Road Drag Leveler Brooms
 Street Push Brooms

Brushes for Every Industrial Need

DALLAS BRUSH MANUFACTURING CO.
 5108 Westmoreland FL 7-6581
 H. S. VanDeventer, Owner

GOOD EQUIPMENT MAINTENANCE

Begins with a

NORTHEAST Vapor Jet Cleaner

Model MD80
80 G.P.H.

\$395



Model HD120
120 G.P.H.

\$545

Freight PREPAID Within Continental U.S.

Backed by over 30 years experience in the design and manufacture of steam
 cleaners, these machines are not "toys" but are fully-rated, high performance
 steam cleaners, sold through over 60 construction equipment distributors
 throughout the country.

Simple, dependable, trouble-free.

Cleaning compound does not pass through coils or pump.

FOR FURTHER INFORMATION SEND COUPON TODAY

NORTHEAST INDUSTRIES, INC.

MIDLAND PARK, NEW JERSEY

☐ Send literature and name of nearest distributor.

☐ If territory open, send distributor information.

NAME ADDRESS

CITY ZONE STATE

CLEARING HOUSE SECTION

- 1—USED 1959 REX 125 Porto Plant, Semi-Automatic, 350 Bbl. Cement Bin, 125 Ton Agg. Like New—Only 35,000 Yards.
- 5—USED 1959 REX 6 Cu. Yd. Moto Mixers, Separate Engine Drive, 75 Gal. Water Tanks, Mounted on Four (4) FWD Tandem Trucks and Int. R-190 Tandem. Only 2500 Miles on Trucks.
- 2—Fruehauf Bulk Cement Trailers 100-110 Bbl. Capacity.
- 1—USED REX Cement Car Unloader, 600 Bbl. per hour.

This Equipment was used on only one (1) Job and is in excellent condition.

WESTERN CONTRACTORS SUPPLY CO.
 4817 LAKE STREET MELROSE PARK, ILLINOIS
 CO lumbus 1-8875
 FI llmore 5-0690
BILL BARRETT
 Nite Ph. FLanders 8-5179
 Palatine, Ill.

FOR SALE

- (5) Euclid 13 yd. bottom dumps.
- (4) Euclid 6 wheeler 14TDT rubber tired 15.5 cu. yd. scrapers.
- (5) Rebuilt TS-24 Euclid twin engine rubber tired scrapers.
- (1) Mod. TC-12 Euclid crawler tractor with dozer, used 5 months, rebuilt.
- (1) Mod. TC-12 Euclid twin engine crawler tractor with pushblade, rebuilt.
- (2) Rebuilt TS-24 Euclid twin engine, rubber tired scrapers, used five months, located in Memphis.

GIL BOERS EQUIPMENT COMPANY

7625 So. Kedzie Avenue, Chicago 52, Illinois Prospect 6-4000

DIESEL TRACTORS

- 10—1955 & 1955 R.D. 205 Internationals with J. T. Cummins Engines with Tag Axles.
- 4—1954 R.F. 195 Tandems 175" wheel base with 8 to 10 yard dump bodies.

A. J. RHIAN

International Truck Dealer

Phone NO 5-2527

YANKTON, SOUTH DAKOTA

We do a Nation-Wide business in STEEL SHEET PILING

FOR SALE OR RENT

50 pos. 48 ft.	Z-32	Missouri
213 pos. 60 ft.	MP-116	Illinois
160 pos. 80-90 ft.	MP-115	Tennessee
218 pos. 98-60 ft.	DP-2	New York
652 pos. 45 ft.	MP-101	Indiana
473 pos. 30 ft.	AP-3	Maryland
168 pos. 25 ft.	DP-2	Penna.
280 pos. 20 ft.	MP-112	Kansas

Storage yards at Buffalo - Baltimore -
 New Orleans - Memphis - Chicago
 Also - H Bearing Pile

McKlennan - Terry and Vulcan Pile Hammers and
 Extractors - Construction and Railroad Equipment.

We are as close as your telephone—you can obtain
 Steel Sheet PILING BY DIALING Chestnut
 1-4474, St. Louis, Mo. COLLECT

MISSISSIPPI VALLEY EQUIPMENT CO.
 1906 Railway Exchange Bldg.
 St. Louis 1, Mo. Chestnut 1-4474

FOR SALE

- Cat D-8 Tractor, Serial #2U19058, with 8A Angledozer and No. 25 Cable Control. Condition Fair. Price, \$5,500.00.
- 3—Int. TD24 Tractors, Serial #241-9271, #TDE-5779 and #TDE-5781, with Angledozer and Double Drum Cable Controls. Price, \$4,500.00 and up.
- 1—Cat D7 Tractor, Serial #3T4538, with 7A Angledozer and No. 25 Cable Control. Condition Fair. Price, \$4,500.00.
- 1—Cat D6-74" Tractor, Serial #9U9597, with 6A Hydraulic Angledozer. Condition Fair. Price \$4,000.00.
- 1—LeT. Super "C" Tournapull, Serial #3693, with Cummins Diesel Engine. Navy Surplus. Almost New. Price, \$3,500.00.
- 3—Cat DW15 Tractors, Serial #70C279, #70C-280, #70C281. Condition Good. Price, \$12,500.00 each. Includes No. 15 Scrapers & No. 27 Cable Controls.
- 1—Cat DW15 Tractor, Serial #76D-81, with No. 428 Scraper and No. 27 Cable Control. Condition Good. Low number of Hours. Price, \$25,000.00.
- 2—Cat No. 12 Motor Graders, Serial #8T4083 and #8T6372, with Scarifier, Power Steering, and 13.00 x 24 Good Tires. Price, \$6,500.00 each.
- 1—Cat No. 12 Motor Grader, Serial #9K3588 with Power Steering, Scarifier and 13.00 x 24 Tires. Price, \$3,500.00.
- 1—Galion T-500 Motor Grader, Serial #1181 with Power Steering, Scarifier and 13.00 x 24 Good Tires. Price, \$6,500.00.
- 1—Bucyrus-Erie 54B Dragline, Serial #56385, Cap. 3 1/2 Yd., with Buda Diesel Engine and 80 Ft. Boom and Bucket 1947 Model. Located at Wolf Summit, West Virginia. Price, \$27,500.00.
- 1—Northwest No. 6 Shovel, Serial #8944, Cap. 1 1/2 Yd., with Murphy Diesel Engine. 1946 Model. Located at Wolf Summit, West Virginia. Price, \$17,500.00.

GREGORY-POOLE EQUIPMENT CO.

P. O. Box 469 - Tel. TE 4-3447
 Raleigh, North Carolina

FOR SALE

Used Equipment as listed, all in good to very good condition; priced to sell:

120 yd. Johnson semi-automatic concrete batch plant; five compartments (one cement)—bulk cement under track truck loader—100 Bbl. bulk cement tank trailer—35,000 sq. ft. Atlas (Irvington) steel speed forms; and 3,000 sq. ft. Economy steel forms for concrete walls—L-41 Lorain crawler crane, 1948, SN 18554—Northwest 95 crawler crane, SN 12527—P & H crawler crane, model 855 LC, diesel, SN 10572, 1946—P & H crawler crane 855-D, SN 10994 (Lorain and P & H cranes have shovel front and backbone attachments)—Kwik-Steam generator, Littleford, model 3600-G—3 TD-24 bulldozers, SN 1914, 2024, 4266—2 Chester 5' diam. dual tandem sheepsfoot rollers—Foots 34E paver, SN 49211—Multi-Foots 34E paver, SN 48020—10 ton, 3 wheel Huber roller, SN 10821—Rome Disc plowing harrow, model TMR 24-30—2 Moretrench well-point pumps complete with 600" pipe main—120 ton Blaw-Knox concrete aggregate weigh bins.

Write P. O. Box 402, Barre, Vermont

FOR SALE

DAGLINES - SHOVELS - CRANES

All Makes and Models,
 1/2 yd. to 35 yd.

EUCLIDS:

Rear, Bottom Dumps and Scrapers

"Other equipment available not listed above"

WILLIAM LUBRECHT, III
 Construction Equipment

311 W. Diamond Avenue Hazleton, Pa.
 Gladstone 5-4041 5-0253

IMMEDIATELY AVAILABLE

2—Mod. 150B (6 cu. yd.) Comb. Shovel-Dragline, Electric, Air Conditioned. Used less than 7000 hours	\$210,000.00 ea.
8—Mod. LRVX Mack Tractors w/30 cu. yd. Mod. 137W Euclid Bottom Dump Trailers. New 1958	36,500.00 ea.
10—Mod. PH95A International Payhaulers w/30 cu. yd. Mod. PW20 Athey Bottom Dump Trailers. Tractors have new 425H P.G.M. Engines	30,500.00 ea.
10—Mod. DW20 Cat Tractors w/30 cu. yd. Mod. PW20 Athey Bottom Dump Trailers, 67C Series	27,000.00 ea.
12—30 cu. yd. Mod. MX30 Southwest Bottom Dump Trailers	5,000.00 ea.
10—Mod. DW20 Cat Tractors w/456P Cat Modified Scrapers, 67C Series	27,000.00 ea.
10—D8 Cat Tractors w/PCU's and Dozers, 14A Series	18,500.00 ea.
5—D9 Cat Tractors w/PCU's and Dozers, 18A Series	26,500.00 ea.
6—Mod. 12 Cat Motor Patrols, 8T and 80C Series	8,500.00 to 10,500.00 ea.
9—15 cu. yd. Mod. 63TD Euclid End Dumps	24,000.00 ea.
4—60" x 20' Link Belt HD Manganese Apron Feeders	12,500.00 ea.
2—30" x 60" Gruendler Single Roll Impact Crushers	9,500.00 ea.
2—6' x 12' Tyler Mod. F800 Single Deck Screens	6,000.00 ea.

CALL, WIRE, or WRITE for Complete Bulletin!

TRINITY DAM CONTRACTORS

10 West Orange Avenue

Phone: PLaza 6-0300, Ext. 279

South San Francisco, Calif.

AVAILABLE NOW

REPLACEMENT PADS

For Gardner-Denver Air Trac

All Steel Grouser Shoe complete with nuts and bolts. Ready to install on your present track chain at a fraction of cost of entire track assy. Prompt shipment. Order today.

Price f.o.b. Boston, Massachusetts \$245.50

Rock Drillers Supply Company, Inc.

201 Victory Road
Dorchester 22, Mass.
Telephone: COLUMBIA 5-1110

BRIDGE COL. FORMS

Steel Frame 3/4 Plywood Skin 4 & 5 Foot Square Mfg. by Blaw Knox—1/2 original cost.

Walter D. Giertsen Co.

3501 Xenwood Avenue
Minneapolis 16, Minnesota

END OF JOB SALE

Late Models - Excellent Cond.

NEW OR PRACTICALLY NEW
AVAILABLE IMMEDIATELY

- 3 cu. yd. Rex Central Mix Plant (1959).
- 6—1959 Reo Dumpcrites.
- 1—Rex Combination Finisher-Float.
- 1—Maxon Spreader, 8-wheel drive.
- 6000 L. Ft. 9"x9"x10' Metalforms (one job).
- Numerous Misc. Equipment for above concrete paving spread.
- 4—1959 Cat #14 Motorgraders.
- 1958 Twin-Shaft Stabilized Base Mixer Cedar Rapids - Model 2 w/Cummins engine.
- 10—1956-58 Tandem Dump Trucks.
- 2—Bros SP-54 Pneumatic Rollers.
- 1—Jackson Vibrating Compactor.
- 10—TS-200 and TS-260 Motorscrapers.
- 2—"D" Tournapulls.
- 5—HD-16 Dozers.
- 1—HD-16 Pusher.
- 1—HD-21 Pusher (1960).
- 3—Rubber-tired Endloaders.
- 2—HD-5 and HD-9 Endloaders.
- 2—Tractor Drawn Scrapers.
- 2—Cranes NW-25; C-16 Michigan.

Pickups, Service Trucks and numerous pieces of construction equipment.

WRITE - WIRE - CALL

BERRY CONSTRUCTION CO.

985 W. Pershing Rd. - Decatur, Ill.

KTV

TOWERS

are SAFE in winds up to 80 m.p.h. faster installation . . . much longer life.

- For Hams
- For Research at Schools
- For Geodetic Survey
- For Wind Measurement
- For Antenna Testing
- For Government Research

We also have heavier towers available for Communication work.

SEND FOR ILLUSTRATED FOLDER

KTV TOWER and COMMUNICATION EQUIP. CO.

P.O. BOX 294 • SULLIVAN, ILLINOIS

FOR SALE

International TD-14 Tractor with Cherry Picker and Hydraulic Angle Dozer Combination. Excellent Condition — \$9,500.00.

Cleveland Trencher, Model 95. Excellent Condition — \$4,250.00.

STANCIL & TREADWAY CONTRACTING CO., INC.

836 Third St., N.W. Atlanta, Ga.
Phone: TRinity 6-1788

CALL UPON **MUTUAL** FOR THE NATION'S LARGEST

PARTS STOCK

Headquarters All Heavy-duty Equipment, Supplies & Parts

• DUMP TRUCKS • LOADERS • CRANES • ENGINES

Lowest Prices - Complete Satisfaction Guaranteed

NEW and Guaranteed REBUILT ENGINES

Completely Dynamometer "Run-In" and Tested in our own modern extensive rebuilding shops.

- HERCULES
- CUMMINS
- CONTINENTAL
- WAUKESHA
- GMC DIESEL

2000 S. WABASH AVENUE
CHICAGO 16, ILLINOIS

25TH YEAR OF QUALITY SERVICE TO
THE HEAVY EQUIPMENT INDUSTRY!



Telephone: CAlumet 5-3500

BUDA

RING SETS

No. MQ402 Standard or K428, \$3.00 per set. Lots of 100, \$2.50.

COMBUSTION ASSEMBLY

No. DE66833 or DE65076, \$1.50 each. Lots of 100, \$1.00.

SPECIAL—C—130 FRAM OIL FILTERS

24 Per Case, case lots 40c each or \$9.60 per case. Lots of 24—35c each or \$8.40 per case in lots of 10 cases or more.

GASKET SETS

No. H11701 for HP 217, \$2.50 each. Lots of 10, \$2.00.

BULLOCK TOOL COMPANY

614 Market Street - Phone 1481
Mt. Carmel, Illinois

BARGAINS IN GOOD USED EQUIPMENT

BUCYRUS-ERIE MODEL 16-B DRAGLINE
NORTHWEST MODEL 6 DRAGLINE
NORTHWEST MODEL 25 DRAGLINE
MARION MODEL 33-M
INTERNATIONAL and HOUGH FRONT END LOADERS
INTERNATIONAL TD18-A BULLDOZER

All completely rebuilt within the past 60 days and in exceptionally good condition.
The above and other pieces at prices reflecting current market conditions.
CALL, WRITE and COME IN.

EVERHART ENGINEERED EQUIPMENT, INC.

2309 Southwest Second Avenue
Fort Lauderdale, Florida
Phone JA 2-0603 Phone JA 2-0604
AT CROSSOVER F.E.C. RAILROAD AND STATE ROUTE 84

STEEL SHEET PILING

LARSEN and ROMBAS
Sections

STOCKS AVAILABLE IN:

- Linden, New Jersey
- Ft. Lauderdale, Florida
- Houston, Texas

WESTERN SERVICES CORPORATION

601 E. Linden Ave., Linden, N. J.
Market 4-4000 Hunter 6-4000
In Florida Call: Port Everglades Steel Co.
Ft. Lauderdale—JA. 4-6548
In Houston Call: G. Oliver—GA. 4-7234

10" PIPE

SUITABLE FOR: PILING, STRUCTURAL USE,
CULVERTS, OR PIPE LINE SERVICE

17,000' 10 3/4" O.D., .365 Wall, 40.48 lbs. Line Pipe Machine cleaned, straight, app. 20' lengths, beveled. Used, excellent condition. Located near Tulsa. Priced low for quick sale.

MID - STATES PIPE AND SUPPLY CO.

703 Philtower Building
Tulsa, Oklahoma
Phone LUther 2-9128

WANTED

Model "C" Electric Tournapulls
1—HD 20 or 21 Push Cat or equal
w/torque

SAM BEEMSTERBOER

11732 S. Yale Avenue
Chicago 28, Illinois
Phone Pullman 5-6000

FOR SALE OR RENT

SHOVEL-DAGLINE, Northwest 80D, Late Model.

H & B MOTO-PAVER, Good condition and a real bargain.

CRUSHER, Pioneer Primary Portable, 24x36 jaw, scalping screen, long feeder, semi-electric.

CENTEX PAVING CO.

1102 Basse Road
Phone PE24342 - San Antonio, Texas

DRAGLINE MATS

Any Length, Width or
Built to Specifications

We build them a little better for a little less.

STRICTLY HARDWOOD.

Also LUMBER and PILING

Kent Piling Co., Inc.

CHARLES KENT, PRESIDENT
Phone Days: Amite 2641 - 2644 - Night 8454
FLUKER, LOUISIANA

TRUCKS WANTED

Highest dollar value paid for new and used trucks and all kinds of used equipment. All types of truck equipment bought and sold, including war surplus. Write, phone or wire:

BILL FISHEL

Vandeventer Auto Sales

717 So. Vandeventer St. Louis 10, Mo.
Ph. Franklin 1-1750

FOR SALE

ATHEY Loader, good working condition.
LINKBELT Model LS-85 Shovel, Cleaned and repaired. Good condition.

QUICKWAY Model 105A 10½ ton Crane & Dragline Combination; hydraulically operated. In excellent condition.

THEW Dragline Model L80; general condition and operating condition fair.

BUCKEYE ¾ Yd. Shovel Front. Good mechanical condition; used about one year.

BROS Self-Propelled 9-wheel rubber tired 10-ton roller; excellent condition. Used less than 150 hours.

ADNUN, JR. Asphalt Spreader & Roller. In very good operating condition.

RYAN EQUIPMENT COMPANY

3350 Morganford Rd. PR 1-0292
St. Louis 16, Missouri

FOR SALE

150 Ton capacity barge, six sections easily transported by truck. Built by Richmond Steel Co. Cost \$19,000.00. Used once. Sell \$12,000.00, with deck engine.

1955 Koehring 304 Crane, drag, clam with G. M. Diesel, long wide crawlers. Very good condition and appearance. Sell \$10,000.00.

27 E Koehring paver with large water heater. Good condition and appearance. Ideal for bridges. Price \$4,000.00.

CASE CONSTRUCTION CORPORATION
MOUNT AIRY, MARYLAND

FOR SALE

1—No. 12 Patrol Late 8-T Series Power Steering. New Tires all around.

Batch-type asphalt plant, 4000 pounds complete. This plant will pass rigid inspection.

One Northwest No. 6 dragline, 1956 model, Murphy Diesel.

One 38-B 1956 dragline with Cat power, excellent condition throughout.

One 7400 1958 model.

GILL EQUIPMENT CO.

Box 708 Miami 56, Florida
MOhawk 6-3512

1½ CY. **SHOVEL BARGAINS** Northwest Shovel #13682, Murphy 50 diesel, very good. \$11,000 Terms. Bucyrus Erie 38B Shovel, #110627, new 1955, excellent. \$27,000 Terms.
LORAIN 15 Ton Motorcrane, MC3, Gov't Surplus, used little. \$600/mo. \$9,000.
QUICKWAY 125A Backhoe, new 1956, 6/10 cy. on 5-ton 6x6 carrier, excellent. \$450 mo. \$6750. Yard.

QUICKWAY L Backhoe, new 1951, 4/10 cy. on 5-ton 6x6 carrier, good. \$300 mo. \$2750. Yard.

EUCLID TWIN ENGINE MOTOR-SCRAPER, 18-24 cy, Tractor 68FTD w/200 hp. GM diesel and Torquematic transmission, 17 S.H. Scraper-pusher w/200 hp. GM diesel, tires 90% or better. Rebuilt and run 3 mo. \$1500 mo. \$18,000.

DIAMOND 2436 Jaw Portable w/feeder, vibr. grizzly, conveyor, Power, tandem rubber. \$19,000. Also Diamond Secondary 4022 Roll Crusher Portable available w/4 x 12 screen, rotator, conveyors, Murphy Diesel, tandem rubber, \$10,000.

CEDARAPIDS 3240 Impact Portable New 1956, complete w/feeder, power conveyor, vibr. grizzly, factory Rubber. Also, Cedarapids 4033 Secondary Portable hammermill plant w/4 x 14 screen, power, factory rubber, new 1956. Excellent. \$65,000 Both.

CEDARAPIDS 1836 Jaw Portable with feeder, conveyor, tandem rubber. Good. \$10,500.

CEDARAPIDS Pitmaster Portable Gravel Plant w/1016 jaw, 1616 roll, 2x10 screen, rotator, power, rubber. Good. \$1000 mo. \$10,000 Yard.

PIONEER 34V Portable Gravel Plant w/1024 jaw, 2416 roll, 3x10 screen, power, tandem rubber. Good. \$1250 mo. \$9500.

CEDARAPIDS 2A Portable Plant with 1624 rolls, 3x8 screen, rotator, power, tandem rubber, U. S. Gov't surplus, like new. 40% new cost. \$1000 mo. \$10,000. Yard.

DIAMOND 2036 roller bearing Jaw crusher w/apron feeder, diesel power. Crusher new 1951. \$6,750.

UNIVERSAL 2036 rb. Jaw Crusher w/feeder & hopper, very good. \$6,500.

McLANAHAN Double Log Washer, 3' x 25' logs, good. \$2,500.

SAUERMAN, 1½ cy. Dragscraper Outfit w/electric motor, bucket, very good, \$4,500.

SCREENS: Deister 5x14 3-deck. Excellent. \$3,500.

CEDARAPIDS 42"x10', 2 deck, flat w/motor. \$1,750.

ALLIS-CHALMERS 5x14 2 deck Lo-Head horizontal, good. \$2,000.

DIAMOND 4x12 3-deck w/motor, excellent. \$1,850.

CONVEYORS, 50'x30", \$1,500. 30'x24", \$900. 125'x24", \$2,000. 50'x24", \$1,350. All complete w/belt, motors, gear reducers, supports.

SHOVEL FRONTS for Lima 34 Paymaster, new, \$1,000. P&H 655B, new, complete w/deck machy. \$4,000.

BACKHOE ATTACHMENTS for P&H 655A, new. \$3500. P&H Mighty Mite, excellent. \$875.

DRAGLINE BUCKETS, 1 cy. Williams, very good. \$600. ½ cy. Williams, new. \$350.

CRANE BOOMS for P&H 655, new 50'. \$1400. Lima 750, new 50', \$1450. Koehring 304, 35', \$600.

FAIRLEADS for BUCYRUS 54B, new. \$685. Lorain 820, new. \$750. Koehring 605, new. \$650. P&H 255A, new. \$300. JIBS. Northwest 71, new. \$400. Lorain TL20, good. \$150. Koehring 304 Revolving, \$300.

BOOM SECTIONS for P&H 655, new 20', 10' & 5' \$15 & \$12 foot. Garwood 5' pin type w/pendants, new. \$65. P&H 255A 10'. \$90. Link Belt K370, 10'. \$150. Buckeye 10', \$75.

INGERSOLL RAND DR600 GYRO ROTARY COMPRESSORS, 600 cfm, portable. Good. Rent \$700 mo. \$7500.

DAVEY 210 cfm Portable Diesel Compressor, late model, completely rebuilt, on rubber. \$250 mo. \$2250.

MICHIGAN 175AD Loaders, #17473D & 18888D, Waukesha diesel, \$10,500. Rental Purchase.

JOY CORE DRILL, class 7, #7563, on IHC truck, late model drill, good. \$2,250.

ASPHALT ROLLERS, Buffalo 10-12 ton Tandem KT19A8, new 1957. Excellent. \$500 mo. \$5,000. Buffalo 10-14 ton 3-wheel VM31D, Cat, diesel, new 1957, excellent. \$600 mo. \$7,000.

CLEAVER BROOKS 3-Car Portable Tank Car Heaters, U. S. Gov't surplus, like new. \$1350 Yard.

WENZEL MACHINERY COMPANY

565 South 10th Mayfair 1-1710
KANSAS CITY 5, KANSAS

WE OFFER

SUBJECT TO PRIOR SALE
THE FOLLOWING:

New Mechanical Joint Cast Iron Pipe,
Class 150, ASA Spec. A-21-11.

1,000 Feet of 24" - 16'	Lengths
2,000 Feet of 20" - 18'3"	Lengths
2,372 Feet of 16" - 18'3"	Lengths
3,128 Feet of 16" - 16'	Lengths

Sizeable am't of fittings for above pipe.

1—450 HP C-B Type GN Diesel Engine
1—450 HP C-B Type GN Diesel type Gas Engine.

All Of Above At Bargain Prices

PHONE, WIRE OR WRITE

Bama Sales Company

P. O. Box 8646 - Pittsburgh 21, Pa.
Phone: CHurchill 2-3911

FOR SALE

CRAWLER CRANE

LIKE NEW USED VERY LITTLE
LORAIN MODEL L72, 1½ yd. with 80' boom and fairleads, Dragline bucket, heavy duty clamshell bucket, G.M. Diesel engine with torque converter, steel erectors, boom hoist, McKiernan-Terry Diesel pile driver hammer with 60 ft. leads. Costs \$80,000 new, will sell for \$40,000.

FELIX CLAUS & SONS
Redlion Road and Northeast Ave.
ORchard 3-8670 Philadelphia 15, Pa.

CONCRETE PAVING EQUIPMENT

FOR SALE

PERFECT CONDITION

Footo 34-E Double Drum Paver, serial No. 46-D-109.

Blaw Knox Concrete Spreader, 20-25 ft., with complete set of vibrators. Model S.D., Serial No. 55-SD-53.

Blaw Knox Transverse, 20-25 ft. Concrete finishing machine. Model X.D. Serial No. 52-6931-30.

James Construction Co.

3147 N. Cicero Ave. - Phone AVenue 2-2236
Chicago 41, Illinois

FOR SALE

T. L. 20 Lorain Shovel with 350 International Diesel motor. A-1 Condition.
..... \$6,750.00

ACME EQUIPMENT & SERVICE CO.

317 Ramsey Street - Box 456
KNOXVILLE, TENNESSEE

Fall Clearance Sale

REF. No.	CRAWLER DOZERS	PRICE
1079	ALLIS-CHALMERS Model HD-5B Tractor Dozer, S/N 17142; GM 3-71 diesel engine, hyd. straight dozer blade, 18" grouser	\$5,500
1103	ALLIS-CHALMERS Model HD-5B Dozer, S/N 28810; diesel engine, hyd. straight dozer blade	\$7,000
1106	ALLIS-CHALMERS Model HD-5B Tractor, S/N 2290, GM 4-71 diesel engine, S/N 35853; Garwood bulldozer blade Model HD-5B, S/N 871; 18" track	\$6,000
895	ALLIS-CHALMERS Model HD-16AC Tractor Dozer; Crawler Dozer, S/N 705, A-C Diesel; hyd. torque converter, cable straight dozer blade Model CT164 w/pusher plate; Model 75 PCU, 23" grouser	\$17,500
CRAWLER LOADERS		
884	ALLIS-CHALMERS Model HD-5G Tractor Loader, S/N 2746, GM 3-71 diesel engine, hour-meter, 1 1/4 cu. yd. hyd. loader TS-5, 13" semi-grouser	\$5,500
1000	CATERPILLAR Model 93B Tractor Loader, S/N 11-A-2435, Cat diesel engine with electric starting, 1 1/4 cu. yd. hyd. bucket, oil clutch, 12" semi-grouser	\$8,900
1053	ALLIS-CHALMERS Model HD6G Crawler Loader, S/N 10577, A-C diesel engine Model HD-544, Model TS-6, 1 1/2 cu. yd. two-position A-C bucket #6029	\$14,000
1123	ALLIS-CHALMERS Model HD4G Tractor Loader, S/N 1432, 1 1/2 cu. yd. A-C diesel engine Model HD-544 S/N 80087, Tractomotive Model TS-6 1 1/2 cu. yd. two-position Loader S/N 943	\$8,520
MOTOR SCRAPERS		
677	ADAMS Model 690 Motor Grader 1400x24-10 ply tires, 671 G.M. diesel, 12 ft. shiftable Mold Board Scarifier, A-1 cond., Cincinnati, Ohio	\$19,500
881	LeTOURNEAU-WESTINGHOUSE Model C Turnapull, S/N GP-40397 CPM, powered with GM 6-71 engine; Lachine windshield; 24-50 x 25, 24 ply Ground Grip tires, Model C Scraper S/N 8-60381 CM-B with 24-50 x 25, 24 ply Nylon tires, sideboards	\$16,000
707	LeTOURNEAU-WESTINGHOUSE Model C Turnapull, S/N GP-40423 CPM, powered with GM 6-71 engine, Lachine windshield, 24-50 x 25, 18 ply tires; Model C Scraper, S/N 8-60984 CM with 24-50 x 25, 18 ply tires, sideboards	\$12,000
1123	ALLIS-CHALMERS Model TS-180 Motor Scraper, 2350 x 25, 10 ply tires, 24 volt starting Air Brakes, adjustable Bucket type seat, Safety Glass; Windshield. Almost new, F.O.B. Cincinnati, Ohio	\$22,500
CRANES AND SHOVELS		
912	LIMA Truck Crane Model 34-T, S/N 235025; 20-ton cap., mounted on 290/456 Dart crane carrier, Waukesha gas engine in crane carrier, crane equipment powered by GM-3-71 diesel engine, high speed worm driven boom hoist, standard back hitch gantry, 35' basic boom, 10' insert	\$19,000
903	P&H Model 855-B Crawler Shovel, S/N 12170, powered by GM 6-71 diesel engine, chain crowd shovel with power boom hoist, 2 cu. yd. bucket	\$24,000
1079	BUFFALO-SPRINGFIELD Model K-45 Compactor, S/N 28123, powered by Cummins Model JV-6-71, diesel engine with torque converter	\$18,500

CARROLL & EDWARDS CO.

Deerfield at E. Kemper Road, CINCINNATI 42, OHIO
Phone: TWood 1-4300 (Night Locust 1-5194)
3159 Enclave Lane, DAYTON 9, OHIO
Phone: AXminster 8-5217 (Night AXminster 8-1680)

FOR SALE

- 1—Northwest 80D, 2 1/2 yd. shovel, Murphy Diesel.
- 1—3500 Manitowoc, 2 1/2 yd. crane, dragline and shovel with Cat. Diesel.
- 1—Lorain 820, 2 yd. crane, dragline and shovel with Cat. Diesel.
- 3—Cat. D8 Angle Blade Bulldozer.
- 4—Euclid 91FD Rear Dump Trucks with GM 671 Diesels.
- 1—Euclid 512 Scraper with GM 671 Diesel.
- 1—Cat. #12 Grader.
- 1—Model 120 Gebhard Double Drum Sheepfoot Roller.
- 1—C. S. Johnson Automatic Central Mix Batching Plant.

CHARLES V. FISH CO., INC.

530 Hamilton St. Allentown, Penna.
Telephone: HEmlock 5-4701

BELIEVE OR NOT IT'S THE TRUTH 1-20 TON STEEL ERECTION CRANE

Power drums, power boom hoist, 30 ft. quick change boom. Hook Block, etc. Purchased new by us from manufacturer

WITH THE PURCHASE OF

Hendrickson Carrier, 3 axle, 1 Beam frame, outriggers, etc. Invite rigid inspection. Cash \$11,100. Chicago.

DONALD B. MACNEAL, INC.

12101 S. Loomis St., Chicago 43, Ill.

Phone
PULmon 5-5040.

LET YOUR HALF TRACK REALLY MAKE TRACKS

Now your half track can go like sixty with practically new treads and wheels from an old, reliable firm. You can save money, too, on tread costs by replacing all idler wheels, thereby prolonging tread life.

A complete set of 2-half track treads and 16-tread idler wheels is only \$480.00. Act today while our stock lasts.

L. B. SMITH WHITE TRUCK CORP.

CAMP HILL, PENNA. - Phone: Harrisburg REgent 7-0555

FOR SALE

1—LeTourneau Westinghouse "C" Electric Scraper, S/n CP-40607-CPF-T, 6-71 GM Diesel, 29.5 x 25 Rubber. This machine rebuilt at 3,761 hours. Present meter reading 4059. This machine is in very good condition.

1—1949 1 1/4 yd. Bay City Combination Shovel and Dragline, Model 65, S/N 5036. Shovel front in almost new condition. Cummins Model HBID Engine. 45' Boom pin connected, 10' insert, 2 sheave boom, 34" pads. Cab. Good condition.

SUPERIOR EQUIPMENT CO., INC.

Powers, Michigan
Phone HX 7-5296

For Immediate Sale

Case Overhead Crane
60 Ton — 10 Ton
Auxiliary 64' Span
Single Trolley Double
Hook — Dynamic
Controls On Main Hoist.
One 15 H.P. Bridge
Motor, one 50 H.P.
Trolley Motor, Two
75 H.P. Hoist Motors,
250 Volt DC

Good Condition

Can Be Seen In
Operation

Call TL 3-2027

Lake City Iron & Metal Corp.

22-52 Bender Ave. Buffalo, N. Y.

For Sale

Established Transit-mix Concrete Business at a sacrifice, illness in family and insufficient capital forces decision to sell.
Business has 2 plants, one in city of 7000 other in county seat city of 4000 eight miles away with no competitive plant in either. Average yearly gross sales past 3 years exceeds \$120,000 with only 4 employees and 3 mixers. Truck or rail delivery of cement. Own aggregate supply, and within trucking distance of light aggregate supply.
Great business potential: 1. area now growing rapidly industrially; 2. Two permanent Federal projects now under construction nearby—a large dam and a National Park; 3. No precast plant within 140 miles nor concrete pipe plant within 80 miles.
Year-round operation. Complete details will be sent to bona-fide interested persons, but area, plants, and potential should be seen to appreciate a real business opportunity.
Write P. O. Box 432 Rogers, Ark.

FOR SALE

Bucyrus-Erie 51-B Crane
Bucyrus-Erie 38-B Crane
Steel Tow Boat
Steel Deck Barge
Single Action Vulcan Hammers
Cleaver-Brooks Electric Boilers
McKiernan-Terry Pile Hammers
Allis-Chalmers Diesel Tractor

Miscellaneous pile driving and
marine construction equipment

HARRY A. THOMPSON, INC.

228 North LaSalle St.
Chicago, Illinois STate 2-8722

MID-WINTER CLOSE-OUTS

25 TON TANDEM LOW-BOY TRAILERS

New and Used Tandem 25 ton Low-boy Trailers with long goosenecks, air brakes, lashing rings, etc. \$2,700.00 to \$3,500.00.

New and Used Single axle Low-boy trailers. \$650.00 and up.

10—Semi-Van closed trailers, used, good for field office, tool shed, warehouse, etc. \$300.00 and up.

BULLDOZERS

1—D-4 Caterpillar with 8 ft. hydraulic blade. New track, rollers, sprockets, etc. \$4,700.00.

1—HD-5 Allis-Chalmers with 8 ft. hydraulic blade. \$2,500.00.

1—TD-18 International with 10 ft. Cable blade, double drum winch. \$4,500.00.

1—Model FD Cletrac with 14 ft. hydraulic blade (angle). Diesel. \$3,500.00.

EARTH-MOVING PANS

1—LeTourneau 4½ yd. cable pan, condition very good. \$1,200.00.

1—Heil cable pan, 6 yd. Condition very good. \$1,750.00.

1—Heil 12 yd. hydraulic pan, \$950.00.

1—Continental 8 yd. hydraulic pan, (very good shape) \$950.00.

2—LeTourneau 22 yd. cable pans. Special for both, \$5,000.00 (tires worth more than asking price).

MISCELLANEOUS

1000—Heavy duty chain binders, \$3.98 ea. Hi-Test chain, ¾". 65¢ per ft. Special in large amounts.

Subject to prior sale and price change without notice.

SURPLUS EQUIPMENT SALES COMPANY

4325 Lincoln Way, E., Mollison, Ohio
Phone: Canton, Greenwood 7-6716
OWNER, JOHN SEPOS SAYS "SELL"

USED MACHINERY FOR SALE

Caterpillar D2 5U 17,000 Series with Hyd. Tool Bar Dozer (Like new) ...\$ 5,700
Caterpillar D6 9U24000 Series with 65 Hydraulic Dozer fully equipped (Low hours) 12,800
Caterpillar Angle Dozer for D8 Cat. ... 1,600
I.H.C. TD 9 Crawler with Hyd. Dozer 4,500
I.H.C. TD14 Crawler with Hydraulic Dozer and Towing Winch. 7,500
Case 400 Crawler with Hydraulic loader (good condition) 2,500
Caterpillar D2 5U 10,000 Series with Hydraulic Dozer (Rebuilt) 4,500
Caterpillar D8 14A 1000 Series with 85 Dozer and No. 29 C.C.U. (Rebuilt) 22,000

HARDINGS, INC.

109 M. Commercial Avenue
Lowell, Indiana
Phone LOWell 4271

FOR SALE

- 1—Manitowoc 3900B Dredgeline.
- 1—Allis-Chalmers HD-21 Dozer.
- 6—Allis-Chalmers TS-360 Motor Scrapers.
- 1—Galion T-118 Tandem Drive Motor Grader (Diesel), 14:00 x 24 Tires.
- 1—Austin-Western 99W Motor Grader (Diesel), 14:00 x 24 Tires.

All equipment purchased new in 1958—presently located in Florida—Any reasonable offer considered for all or any part.

Lincoln E. Squier

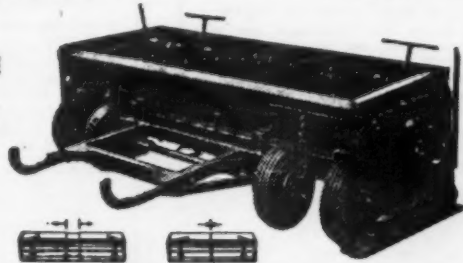
Box 161 — Phone RI 9-8068
Hazardville, Conn.

ROAD MATERIAL SPREADERS WARREN SPREADER-PAVER

TELESCOPES 8' TO 12' IN WIDTH, 0-6" IN DEPTH

ALL PURPOSE

DESIGNED TO DO
A BETTER JOB
IN LESS TIME



Unique features enable units to be hitched to any dump truck with no hitches on truck required. Transported on the tail gate chains. The Warren Spreader-Paver is truly an all-purpose machine for hot mix and road base materials. It does an excellent job from road laying to small driveways. It is a real profit maker for both the small and large contractor.

Dealers — Representatives inquire

WARREN MANUFACTURING CO.

P. O. BOX 413

SPRINGFIELD, OHIO

LEFFEL LANE & PENN. R.R.

FOR SALE

Marcy 4 x 4 Ball Mill, new liners \$3500
Cedar Rapids Jaw Crusher, 10 x 20, new bearings and liners \$2750
No. 2 Hammermill, new liners \$2350
6 x 6 Hummer Vibrator .. \$1850
4 x 10 dble. deck Adamson Vibrator. Like new \$1000
2—New Stephen Concentrating Tables, 4 x 12 ea. \$1500
1—New 3 x 8 Stephen Conc. Table \$1250

Prices all FOB Salt Lake City, Utah

C. L. WHITELOCK

494 S. Main - Phone 592 - Payson, Utah

3000 Watt AC Generating Set

Engine Model ZXB Hercules, 4 Cylinder Water cooled with 6 volt Starter, Hobart Generator, 115 Volt, 60 Cycle, 1200 RPM. Completely Hooded with panel board. All diam. 53" long, 25½" Wide, 31½" High. Shipping weight 791 lbs.

F.O.B.

Our Yard - Each.. \$345.00

MID-WAY Supply Company

P. O. Box 427 - Irving, Texas
Phone BLackburn 3-3753

1956 SAW MILL

Portable, all steel, on rubber with top saw.

CAT POWER UNIT

1956 D318 in steel tandem trailer on rubber.

3-SAW EDGER

1956 Minor on rubber with trim saw.

HEAVY DUTY

2—24" Bottom Gang Breaking Plow. Good Condition.

TRUCK

1956 G.M.C. 500 tandem-drive, power steering, good rubber, new motor and hydraulic transmission.

FORK LIFT

4-wheel-drive.

D4 CAT

1951 with hydraulic dozer, Hyster winch and log arch.
Come and see machinery working Monday through Friday 12½ miles east of Cass Lake on #2 and 4½ miles south on Sucker Bay Road.

Chester Kimball

Park Rapids, Minn. Phone: 415 Week Ends

LORAIN

MODEL 820

COMBINATION CLAMSHELL CRANE - DRAGLINE

65' Boom, Pendant Suspension, 34" tracks, tagline, powered by Cat D13000 diesel engine. This machine has been completely torn down and re-manufactured from undercarriage to boom tip. It is in "like-new" condition and, of course, carries our guarantee.

Wire or call collect - CY 2-1800 for inspection appointment and special year-end inventory close-out price.

H. O. Penn Machinery Company, Inc.

140th Street & East River
New York 54, New York

CLEARING HOUSE SECTION

JANUARY SPECIALS

- 1—P&H ¾ Yd. Clamshell and Dragline.
- 2—Lorain Model L-25K ¾ Yd. Cranes, GMC engines, good condition.
- 1—Wayne ½ Yd. capacity Wagon Crane with ½ Yd. bucket, 30' boom.
- 1—Quick-Way Model E Backhoe Attachment.
- 2—Huber Model HM Maintainers, one with Front-end Loader and one with Bulldozer Attachment.
- 1—Hough Model HM Loader.
- 1—Cat. Model 933 Traxcavator Crawler Loader.
- 1—International Model TD-9 Crawler with Drott Front-end Loader.
- 1—Terratrac Crawler Loader equipped with Angle Bulldozer and Rear Scarifier.
- 1—John Deere Crawler Front-end Loader.
- 3—Haiss Model 75-W Bucket Loaders.
- 2—Huber 10-Ton 3-Wheel Rollers—one Hercules Gas, one Cat. Diesel.
- 1—Scaman-Andwall 17 Wheel 7-20 Ton Compactor.
- 2—International Model TD-6 Crawler Tractors equipped with Bulldozers.
- 1—Barber-Greene Model 879 Paver.
- 1—Barber-Greene Model 711 Ditcher.

DEEDS EQUIPMENT

8015 E. 45th St., Lawrence, Indiana
Ph. Liberty 5-3331
913-15 Main St.
Rochester, Indiana
Capital 3-2146

FOR SALE

- 1—3 DW 21 Cats w/#21 scrapers ser. #8 W1317 & 8V 1839. Excellent including rubber-wide heads, re-built Each \$18,900.00
- 3—2 DW 21 Cats w/#470 scrapers series 58C. Excellent Each 25,000.00
- 3—3 WD 69 Koehring Dumpsters serial #1238, 2882, & 4378 Each 5,500.00
All 15,000.00
- 4—D-8 Cat. series 15A push plate only. excellent 16,800.00
- 5—DW 10 Cat. ser. #1V1514 w/#10 pan, good 6,500.00
excellent 7,500.00
- 6—Bacile twin screw Log Washer, 7' x 50' 5,500.00
- 7—Cat. #12 M.G. ser. #8T19025, oil clutch, excellent 11,500.00
- 8—Cat. 79 pan ser. #8C 2358, large tire group 5,800.00
- 9—LeTourneau L-8 pan ser. #8S3343 LS-P 1000x20 rubber 3,800.00
- 10—Blaw Knox widener model 95, excellent 7,500.00
- 11—Gallon 20" Trench Roller, near new 4,750.00
- 12—3 Gallon Chief Rollers, excellent, Price on request
- 13—3 Barber-Greene #40 Asphalt Plants 25 to 30 tons per hour. Your choice 16,000.00
- 14—1—Euclid Bottom Dump Model 25PTD serial #3738 with 58-W wagon, Cummins engine 5,000.00
- 15—2 Cat. 7A Blades complete Each 1,350.00
- 16—Fleco 10 tooth root rake for Cat. 7A. Like new 850.00
- 17—#25 Cat. C. C. for D-6 1,000.00
- 18—#25 Cat. C. C. for D-8 1,100.00
- 19—Hyster D4N Winch 900.00
- 20—Cat. 68 Blade w/#24 C. C. complete 1,250.00

Tel. JIM POWELL Tel.
FR 7-1896 P.O. Box 1604 Mobile
EM 6-3331 Charlotte 1, N. C. YJ 5-3756



Truck-mounted backhoe helps owners work jobs far afield

Backhoe Does Cross-Country Exploration

Although truck-mounted backhoes aren't ordinarily thought of as exploration tools, here's a profitable "exception". Working around Oroville in Northern California, this ¾ yd. Hy-Hoe Model 300, mounted on a 6-wheel-drive army surplus truck, regularly makes off-highway sorties of 2 to 10 miles, to locate clay, gravel, and quarry rock for construction projects. On the job pictured, river-bottom excava-

tions were being made to a depth of 14 ft.

Owners of the machine, Hi-Ho Excavators, of Oroville (they named their company after the machine), report that operating costs are less than with the former rig, while the machine has been grossing about \$3,500 a month. Besides exploratory work, they keep the unit busy on such varied jobs as excavating for septic tanks, fuel tanks, foundations, leech lines, sewer lines, electrical lines, and placing and backfilling culverts.

New De-Icing Methods for N. J. Bridges

"Bridge May Be Slippery" is the New Jersey sign message posted for the 1960-61 winter at 500 principal bridges on the state system. New diamond-shaped signs installed late in 1960 have black letters on a reflectorizing yellow background.

The statewide sign posting operation stemmed from a planned change in winter snow and ice control procedure. For the past two winter seasons the New Jersey highway department has used rock salt for roadway de-icing. While studying the effect of chemical de-icing on pavements and structures, the department has switched to sand and cinders lightly treated with calcium chloride for bridges and 500 ft. of pavement on either side.

The change is designed to help department engineers in evaluating possible damaging effects of heavy chemical concentrations on structures. A statewide news release outlined this program to New Jersey motorists.

Elsewhere on the New Jersey state road system the maintenance crews are continuing to fight snow and ice with the help of rock salt (22,000 tons), abrasives such as sand and cinders (30,000 cu. yd.) and calcium chloride (2,970 tons). There will be 1,750 pieces of snow and ice equipment available for the 1960-61 winter, 301 more than last year.

Ice Control Film Offered by Dow

"Highway Ice Control," a 16-mm color and sound motion picture, has been released by The Dow Chemical Company.

The 12-minute film points up advantages of calcium chloride-sodium chloride mixtures; shows current methods used by turnpike engineers who pioneered the use of chemical mixtures for winter road maintenance; features bulk handling and application of chemical de-icers for more efficient operations.

The picture is available on loan from Dow sales offices or from Dow's Highway and Construction Materials department, Midland, Michigan.



Some 247 tons of five-gauge copper-bearing galvanized steel plates were corrugated into sections for the pipe-arch vehicular tunnels.

King-Sized Steel Arches

A pair of record-sized corrugated steel pipe-arches form an underpass on Interstate highway 74 near Peoria, Illinois. The arches, furnished and installed by U.S. Steel's American Bridge Division, provide parallel one-way traffic ways, each to carry a 14-ft. pavement and walk.

Each of the twin structures is 334 ft. long, 20 ft. wide and 17 ft. high. Required far less time to erect than a conventional bridge-type underpass, the corrugated steel units were shipped from American Bridge's Shiffler plant in Pittsburgh, Pa. A ten-man crew under superintendent Walt Falkenberg finished the job in less than a month.

Some 247 tons of five-gauge copper-bearing galvanized steel plates were used. The plates, chiefly about 5' x 8' size, were shop-fabricated to specified shape for quick field bolting to form the arched, flat-bottomed structure. Some 36,000 high-strength galvanized bolts secure the sections. Individual steel plates were bolted together to form large sections weighing as much as five tons. The sections then were moved into position at the site—all of the bottom sections first, then the top sections.

The underpass was erected for Capital Supply Company, Springfield, Illinois, subcontractors under S. J. Groves & Sons, Springfield, general contractor for the Interstate 74 project.



Completed tunnels taking shape. Each will carry a 14-ft. concrete pavement and a walkway.



MULTIROLL FILES

IDEAL FOR... PLAT PLANS PROJECT PLANTS

File constructed in 200 lbs. test corrugated container.

9 TUBE MODEL Tube I.D. 4 1/8"

MODEL NUMBER	0930	0936	0942
Size			
13 1/2 x 13 1/2 x L	31	37	43
Inside depth	30 1/2	36 1/2	42 1/2
Price	\$11.50	\$12.00	\$12.50

16 TUBE MODEL Tube I.D. 3 1/8"

MODEL NUMBER	1630	1636	1642
Size			
13 1/2 x 13 1/2 x L	31	37	43
Inside depth	30 1/2	36 1/2	42 1/2
Price	\$12.00	\$12.50	\$13.00

Color Med. Gray • F.O.B. St. Clair Shores, Mich.
SOLD DIRECT ONLY
25 and 49 Tube model avail. Write for brochure.

ROLL & FILE SYSTEMS, INC.

P. O. BOX 3863
DETROIT 5, MICH

For more details circle 323 on
Enclosed Return Postal Card.

NEW! EFCO BRIDGE COLUMN FORMS

EFCO Bridge Column Forms used on New Orleans overpass save time and labor. Precision construction permits quick, easy stripping as shown. Adaptable to a wide range of uses. Ideal for forming pier nosings when combined with regular EFCO Forms.



MAIL
COUPON
TODAY

Economy Forms Corp.
Box 128-AG
H. P. Station
Des Moines, Iowa

Please send information on EFCO Bridge Column Forms, and address of nearest sales office.

Name.....

Firm name.....

Address.....

City.....State.....

... for more details circle 291 on enclosed return postal card

Manufacturers' Literature

ICE CONTROL EQUIPMENT: The Baughman Spread-Mobile manufactured by Baughman Mfg., Jerseyville, Ill. is shown in a recent 3 color literature piece available from the manufacturer.

Spread-Mobile Model FS-56, features a center-spread design, which permits distribution of a pattern that covers the area in front of all four wheels. Bodies are available throughout the United States.

For more details circle 169 on
Enclosed Return Postal Card.

BALL BEARINGS: The availability of a catalog presenting the complete line of quality ball bearing units was announced by Sealmaster Bearing Div., Ridgeway Ave., Aurora, Ill. The literature features comprehensive technical and engineering data, specifications, diagrams and illustrations of the ball bearing line. Descriptive copy points out the permanent seal, pre-lubrication, self-aligning and zone hardening features of the ball bearing units.

For more details circle 170 on
Enclosed Return Postal Card.

GENERATORS: A new bulletin describing its full line of a.c. and d.c. generators and motor generators is announced by Howell Electric Motors Co.

Built by Howell's subsidiary, the Le-land Ohio Electric Co., Dayton 1, Ohio, the generators range from 1/2 through 15 kva, a.c., or 1/2 tp 3 kw d.c. The motor generators produce direct current from a.c. power supply; single phase alternating current from d.c.

For more details circle 171 on
Enclosed Return Postal Card.

INDEX: A new, 11 page index of Bendix G-15 civil engineering programs is available. The index contains an extensive listing of applications prepared by G-15 computer users, and submitted to the Users' Exchange library at the Bendix Computer Division, 5630 Arbor Vitae St., Los Angeles 45, Calif., through the G-15 Users' Exchange Organization. Programs developed by the Computer Division applications group are also listed. Programs in the following categories are represented: Traffic, surveying, earthwork, culverts and sewers, soils, interchange, bridges and piers, beams, columns, section properties, miscellaneous analysis, and hydraulics. Copies of the index will be mailed on request.

For more details circle 172 on
Enclosed Return Postal Card.

NEW TRACTOR: A brochure featuring a new model of the Napco Crab four wheel drive, four wheel steer construction and industrial tractor has been made available by the Construction

Equipment Division of Napco Industries, Inc., 834 N. Seventh St., Minneapolis 11, Minn.

The four page, three-color brochure features the new six cylinder model with a fibre glass hood and built-in headlights. Also highlighted by the brochure are the great variety of attachments, both front and rear, which are available. Included are: loader, dozer blade, backhoe, forklift, snow plow, winch, pipe laying side boom, tow hook and street sweeper. The new brochure also lists complete specifications for both four and six cylinder models.

For more details circle 173 on
Enclosed Return Postal Card.

EQUIPMENT CATALOG: A new 24-page full-color catalog-type brochure has been published, showing the entire new equipment line of Massey-Ferguson, 1009 S. West St., Wichita 13, Kan. Action photographs, cutaway drawings, operating information and specifications material on the many items in the M-F industrial line are covered in the informative brochure.

For more details circle 174 on
Enclosed Return Postal Card.

DIESEL SERIES: Illustrated literature on the new 990 diesel series is now available to interested operators, it was announced by Diamond T Motor Truck Company, 4401 W. 26th St., Chicago 23, Ill.

The 990 is Diamond T's new 90-inch BBC diesel which hauls a 40-foot square-nose trailer within an overall length of 50-feet, with ample clearance even in full-jackknife turns. Diamond T's "D" cab is standard on the new 990, a full 72" wide.

For more details circle 175 on
Enclosed Return Postal Card.

WIRE ROPE: Available from Bethlehem Steel Co., Bethlehem, Pa., is an illustrated catalog, "Wire Rope for Construction and Industrial Equipment," containing specific recommendations for use of wire ropes on various types of construction and industrial machinery. The ropes selected are those which experience has shown to give the best performance on equipment such as power shovels, dredges, scrapers, dozers, derricks, hoists, pile drivers, pavers, overhead traveling cranes, car spotters, conveyors and winches. Rope reeving diagrams show typical line arrangements.

The catalog also includes basic wire rope information, and discusses special rope features, grades, constructions, lays and cores. Detailed data on all standard Bethlehem ropes, as well as fittings for these ropes, are included in separate sections.

For more details circle 176 on
Enclosed Return Postal Card.

PARTS DIRECTORY: A handy directory of world-wide sales, service and parts outlets for Detroit Diesel, 13400 W. Outer Drive, Detroit 28, Mich., has been prepared by the factory for truckers and contractors whose equipment is constantly on the move.

Over 600 outlets in the United States, Canada, Mexico and overseas are listed by state, province and country, giving the addresses and in most instances telephone numbers that can be called day or night for parts and service.

For more details circle 177 on Enclosed Return Postal Card.

CONCRETE DARKENING: The A. C. Horn Research Laboratories released a complete catalog covering A. E. Dispersed Black, a semi-paste pigment for darkening concrete—either air entrained or regular concrete—either monolithic or topping construction. It does not reduce air content in air entrained mixes. It offers uniform dispersion and greater color retention, helps to define curbs, islands and traffic markings, reduces sun and auto headlight glare, and assists in de-icing of roads and sidewalks. Included are advantages, descriptions, color values, uses, mixing instructions, testing procedures and quantity data.

For more details circle 178 on Enclosed Return Postal Card.

ENGINE PAMPHLET: Twenty-seven International diesel and carbureted engines—in four, six and eight-cylinder versions—are detailed in a new, three-color pamphlet issued by International Harvester Company's Construction Equipment Div., 180 N. Michigan Ave., Chicago 1, Ill.

Of the 27 units, which are available from stripped engines to complete power units, 10 are diesels, with two of four-cylinder design and eight of the six-cylinder category. In the carbureted line, shown are two four-cylinder units, 12 of six cylinders and three V-8 models. Horsepower ratings range from 16.4 to 385. Weights are from 279 to 6,045 pounds.

For more details circle 179 on Enclosed Return Postal Card.

DRILLS: A new bulletin is available from Gardner-Denver Co., Quincy, Ill., announcing the "Mole-Drill" model AM5A. This efficient "down the hole" drill has a rugged 5 in. diameter and is 41 in. long with bit attached.

The "Mole-Drill" is designed for heavy, rugged service for the construction, quarry and petroleum industries. Positive hole cleaning is assured by air passing through the air tube to the bit. Exhaust vents in the drill also provides additional air for hole cleaning. Drill weight is 148 pounds and air consumption at 100 lbs. is 480 cfm. Bits are available in sizes 5 3/4, 6 and 6 1/4 in.

For more details circle 180 on Enclosed Return Postal Card.

With The Manufacturers

CONSTRUCTION INDUSTRY MFG.: William F. Miller, vice president-sales manager of Hy-Way Heat Systems, Inc., has been elected by 17 manufacturers as chairman of the Bituminous Equipment Manufacturers' Bureau, recently organized under the sponsorship of the Construction Industry Manufacturers Association. The total membership of the Construction Industry Manufacturers Association (CIMA), produces approximately 95% of the dollar volume of the construction machinery sold in the United States.

B. F. GOODRICH: G. W. Hill, who joined the B. F. Goodrich Co., as a mailboy in 1933, has been named manager of the New York operations of International B. F. Goodrich Co., a division. After serving a few years in the company's Industrial Products Co., he was transferred to the international division in 1939 and after short service in New York, went to Europe and then to the Philippines as sales representative and later sales manager. In 1946 he returned to Akron, his home, as sales manager of Industrial Products in the International Company.

SUN CHEMICAL CORP: Election of Eugene Jacobson as a vice-president of Sun Chemical Corp., was announced by Sun's president.

The elevation of Mr. Jacobson came within months after Sun's purchase last November of Facile Corp., which Mr. Jacobson organized in 1941 and headed as president until sold to Sun.

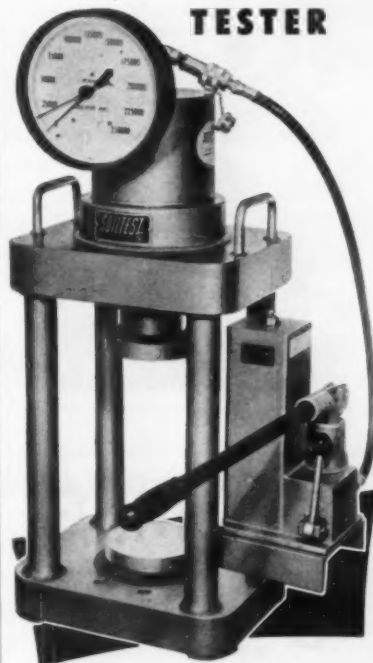
CLINTON ENGINES: Dates for Clinton Engines Corporation engine and chain-saw schools for the balance of 1960 were announced by the company.

The schedule is as follows: Engines—September 19; October 3, 17, 31; November 28; December 12; Chainsaws—September 12, 26; October 10, 24; November 14; December 5.

Each school session runs for five days, Monday through Friday. Applications for enrollment are handled through local Clinton distributors. Registration is limited to 24 men per class, each of whom pays a \$20 registration fee.

ARMCO STEEL: A new identifying trademark and the standardization of the company signature has been announced by the Armco Steel Corp. The new mark modernizes the 46 year old inverted triangle. The first trademark

SOILTEST ENGINEERING TEST APPARATUS NEW, LOW PRICED CT-710 CONCRETE TESTER



250,000 POUNDS CAPACITY FOR TESTING CONCRETE CUBES, BLOCKS, BEAMS AND CYLINDERS.

**ACCURATE
PORTABLE
COMPACT**

SIMPLE TO OPERATE: Loads are quickly attained by easy hand operation. The applied loads are shown on a large diameter dial gauge.

PRICE \$580.00 F.O.B. CHICAGO

SOILTEST Incorporated

WRITE TODAY FOR
CT-710 BULLETIN

4711 W. NORTH AVENUE • CHICAGO 39, ILLINOIS

... for more details circle 327 on enclosed return postal card

Best Location
for **LOS ANGELES**
and **HOLLYWOOD**
Starlite
MOTEL

AIR-CONDITIONED, TV AND HI-FI,
PHONES, POOL, COFFEE SHOP,
SOUND-PROOFED ROOMS.
ELEVATOR. CREDIT CARDS ACCEPTED.

Write for Brochure and Reservations
250 SILVER LAKE BLVD.
LOS ANGELES 4, CALIF.



Rooms & Suites
... to please the most
discerning at the **BELMONT**

Overlooking Lake Michigan and Belmont Yacht Harbor. 12 minutes from the loop—direct buses at the door. Spacious parking. New Banquet and Meeting rooms accommodate up to 400 persons. Charming, new Mansion House Dining Room and unique Cocktail Room—The Dam Site.

700 Rooms & Suites
TRANSIENT
& PERMANENT

Full Hotel Services
Singles . . . from \$9
Doubles . . . from \$13

F. J. PETITMAIRE
General Manager

Belmont
Hotel

BITTERSWEET 6-2100
3172 NORTH SHERIDAN ROAD
CHICAGO

used by the company was in 1914. The new design is still the triangle, but has the company name drawn through it at the center, making for clear readability.

ALLIS-CHALMERS: Reported to be the world's first vehicle powered by self-contained and controlled fuel cells, an experimental tractor built by Allis-Chalmers Research Div. was presented to the Smithsonian Museum of History & Technology. The original idea of fuel cell power has been known since 1839.

AUTOMOBILE MFG. ASS'N.: Ralph M. Buzard, vice president, Motor Truck Div., International Harvester Co., has been elected chairman of the Automobile Manufacturers Association's Motor Truck Committee. He succeeds E. J. Bush who had served as chairman of the AMA committee since 1947.

AMERICAN BRIDGE: The appointment of a former Gary, Ind. engineer, J. D. Rollins as president of American Bridge Div. of the U.S. Steel Corp. became effective January 1. Rollins attended Carnegie Institute of Technology and Armour Institute of Technology. He joined U.S. Steel in 1934 as an estimator.

OLIVER CORP.: The 112 year old Chicago company, recently enveloped as a subsidiary of the White Motor Co., has announced a change in the trade mark. The traditional red and green shield has been changed to a keystone around a sturdier shield with bold orange, black and white colors and the name in block letters.

POWER CURBER, INC.: In a decision by the U.S. District Court, Western District, North Carolina, Judge Warlick upheld the validity of the Power Curber's basic curbing machine patent. The decision, judged against E. D. Etnyre & Co., holds Power Curber's patent to be a "pioneer invention." Damages and costs were awarded, along with attorney fees.

WET SOIL STABILIZATION: A new catalog with "on-the-job" pictures has been released by the Moretrench Corp., Rockway, N.J. It describes Moretrench equipment and shows many types of projects where predrainage by the company's wellpoint systems has cut costs and helped solve construction problems. The company makes a system-method of dewatering, stabilizing and preventing mass movement of wet soils during excavations.

STEEL FORMS: A detailed story on the design, features and applications of the Mataforms, a steel form manufactured by Metal Forms Corp., Milwaukee, Wis. has been released by that company.

The forms are designed for interchangeable use—gutters, sidewalks and curbs. The catalog, a 20 pg. booklet, describes and explains the use of curb and gutter forms, division plates, radius forms and sidewalk forms. A suggested specifications sheet for steel forms is offered in the back of the book.

Convenience
Comfort, Economy
Anywhere in
ST. LOUIS

HEART of ST. LOUIS

108 N. Kingshighway
Facing beautiful Forest Park
Hotel

Ambassador

One of St. Louis' finest hotels
— 300 rooms & suites —
completely air-conditioned. T.V.
Fine Convention Facilities.

Free Parking.
Rates from \$6.



DOWNTOWN

11th and Pine

HOTEL DeSOTO

Steps from Business &
Shopping area. 250 fine
rooms. Air-Conditioned.—T.V.
Rates from \$5

Free Parking



NORTH SIDE

Natural Bridge at Spring
Overlooking Fair Grounds

Hotel Fairgrounds

Two blks. from Busch Stadium
— Nat'l. League Baseball Park.
250 rooms with bath.
Air-Conditioned.—T.V.
Rates from \$5

Free
Parking.



FREE PARKING

B. H. TUREEN HOTELS

High-Strength Reinforcing Steel

New facts on the behavior of concrete structures utilizing modern steel reinforcing bars—almost twice the strength of conventional bars—has been compiled in the civil engineering research laboratory at Cornell University, Ithaca, N.Y. George Winter, head of structural engineering, is directing research on the subject.

A Cornell bulletin notes that reinforced concrete construction has advanced spectacularly since World War II with the introduction of prestressing, mass prefabrication, and refinements in design methods. Now, as a further advance comes advances in steel-making making possible stronger steel reinforcing bars without substantial difference in price. The work of Prof. Winter and his assistants has made it possible to apply the improved bars structural design.

The Cornell research team's results were reported at the January, 1960 meeting of the Highway Research Board, and at other technical meetings during the year. Cornell researchers have shown what measures must be taken to limit short-time and long-time deflections of such structures to acceptable values, to keep width of hairline cracks within safe and tolerable bounds, and what methods must be used to calculate strength.

DOMINIC SEVERINI, Detroit, was the successful bidder at \$57,700 on a lot and building in Detroit offered at public auction recently by the Michigan state highway department in connection with freeway right-of-way clearance. There were 68 bids.

Winter Fun is King at The KING'S GATEWAY



Thrill to a winter wonderland weekend or full vacation.

EVERYTHING TO DO

Ice Skating (Instruction available) • Skiing—3 Ski Tows Operating Daily (Instruction and all necessary equipment available) • Snowshoeing • Tobogganing • Ski-Joring • Sleigh Riding • Hunting • Ice Fishing

EASY TO REACH

On U.S. 45 on the Wisconsin-Upper Michigan Border at Land O'Lakes, Chicago & North Western R. R. offers Pullman Service, to Land O'Lakes—overnight from Chicago and Milwaukee.

Write for
information
or
reservations.

MUSIC • DANCING • ENTERTAINMENT



HOTEL

and INN

Land O'Lakes

WISCONSIN

Phone 261



WHAT ABOUT YOU, MR. READER?

Are you still active in the field? Have you moved or changed your position?

Unless you send this information directly to use we can't be sure. Sometimes a reader's name is cut from the mailing list because we are not sure that our information as to name, title and address is right. *Your* name might be cut from the mailing list.

Don't Let This Happen to You

Even if you think we know all about you, please fill in the information requested below and send to us by return mail. Our auditors require proof of accuracy of our mailing list. *You* are the only person who can help us on this. Do it now before you forget, so you can be sure your magazine will always be properly addressed to you. New names cannot be added or old names retained on our list unless we have *all* this information. *Please print or type.*

ROADS AND STREETS

DATE _____

22 WEST MAPLE STREET, CHICAGO 10, ILL.

- ☐ I do receive ROADS & STREETS and wish to continue to receive it.
☐ I do not receive ROADS & STREETS but would like to have it.

NAME _____

TITLE OR OCCUPATION _____

FIRM NAME OR GOVERNMENT DEPARTMENT (give street address) _____

CITY _____ ZONE (if any) _____
(If you have moved give old and new address)

STATE _____

SIGNATURE _____

Index to Advertisers

Acme Equipment & Service Co.137
 Acme Iron Works130
 Allied Materials Corp.31
 Allis-Chalmers56 & 57
 American Manganese Steel
 Division68 & 69
 American-Marietta58

Bama Sales Company137
 Barber-Greene104 & 105
 Beasley Machinery Co.,
 Miller C.131
 Beemsterboer, Sam136
 Berry Construction Co.135
 Bethlehem Steel Company3
 Boers Equipment Company, Gil134
 Brooke, Norman S.131
 Bullock Tool Company136
 Butler Bin Company12

Carroll & Edwards Co.138
 Case Construction Corporation137
 Caterpillar Tractor Co.10 & 11
 Centex Paving Co.136
 Chain Belt Company52 & 53
 Clark Equipment Company,
 Construction Machinery
 Division76 & 77
 Clauss & Sons, Felix137
 Colorado Fuel & Iron
 Corporation, The74
 Columbia Southern Chemical
 Corporation75
 Cutler Engineering Company117

Dallas Brush Manufacturing Co.133
 Deeds Equipment140
 Deere & Company32
 Dietz Company, R. E.6

Economy Forms Corporation142
 Eighmy Equipment Company132
 Eimco Corporation, The95, 96, 97
 Essick Manufacturing Company121
 Etnyre & Co.113
 EUCLID Division of
 General Motors14 & 15, 89
 Everhart Engineered Equipment,
 Inc.136

Fish, Co., Inc., Charles V.138
 Fishel, Bill136
 Ford Motor Co., Tractor and
 Implement Division115
 Ford Motor Company,
 Truck Division26 & 27, 28 & 29
 Freed, Philip E.133
 Fund Insurance Companies, The30
 Funk Mfg. Co.129

General Motors Corporation,
 EUCLID Division14 & 15, 89
 General Motors Corporation, Truck
 & Coach Division41, 42, 43, 44
 Giersten Co., Walter D.135
 Gill Equipment Co.137
 Goodyear, Truck Tire Dept.5
 Gregory-Poole Equipment Co.134
 Guardian Trust Company131

Harding's Inc.139
 Hetherington & Berner Inc.101
 Hotel Ambassador144
 Hotel Belmont144
 Hotel King's Gateway145
 Hotel Starlite Motor144

International Harvester Company,
 Construction Equipment
 Division18, 48 & 49
 International Harvester Company,
 Farm Equipment
 DivisionThird Cover

Jackson Vibrators, Inc.Second Cover
 Jaeger Machine Company, The125
 James Construction Co.137

Kano Laboratories129
 Kennedy's Van Brush Mfg. Co.130
 Kent Piling Co., Inc.136
 Kimball, Chester139
 Koehring Company, Buffalo-
 Springfield Division66 & 67
 Koehring Company, C. S. Johnson
 Division55
 Koehring Company, Flaherty Dept.93
 Kolman Mfg. Co.132
 KTV Tower and Communication
 Equip. Co.135

Lake City Iron & Metal Corp.138
 LeTourneau-Westinghouse
 Company21, 22, 23, 24
 Lewiston Pre-Mix Concrete Inc.132
 Lima Works, Construction
 Equipment Division, Baldwin-
 Lima-Hamilton Corporation16 & 17
 Lubrecht, William III134

Mack Trucks, Inc.78
 MacNeal, Inc., Donald B.138
 McConaughay, K. E., Inc.110 & 111
 Manitowoc Engineering Corp.73
 Mid-way Supply Company139
 Mid-States Pipe and Supply Co.136
 Mine Equipment & Supply Co.132
 Mississippi Valley Equipment Co.134

Motorola Communications &
 Electronics, Inc.90
 Mutual Truck Parts Co., Inc.136

National Lead Company98
 National Lime Association7
 Northeast Industries, Inc.133

Owen Bucket Company, The99

Panama Machinery132
 Penn Machinery Company,
 Inc., H. O.139
 Pittsburgh Steel Company, Steel
 Products Division84 & 85
 Portland Cement Association83
 Powell, Jim140

Reo Division,
 The White Motor Company61 & 62
 Rhian, A. J.134
 Rock Drillers Supply Company,
 Inc.135
 Roll & File Systems, Inc.142
 Ryan Equipment Company137

Smith White Truck Corp., L. B.138
 Soiltest Incorporated143
 Squier, Lincoln E.139
 Stancil & Treadway Contracting
 Co., Inc.135
 Standard Steel Corporation47
 Superior Equipment Co., Inc.138
 Surplus Equipment Company139
 Swick-Guth Company127
 Symons Clamp & Mfg. Co.123

Tarrant Mfg. Co.127
 Texaco Inc., Lubrication
 Division8 & 9
 Thiokol Chemical Corp.13
 Thompson, Inc., Harry A.138
 Timken Roller Bearing
 CompanyBack Cover
 Trinity Dam Contractors135
 Troyer Equipment Co., Stanley B.133

Vandeventer Auto Sales136

Warren Manufacturing Co.139
 Wenzel Machinery Company137
 Western Contractors Supply Co.134
 Western Services Corporation136
 Westport Machinery Co.131
 Whitelock, C. L.139
 Williams Mfg. Co., Hugh B.119



As rolling resistance decreases, operator of the 61 hp* International 460 can shift up and "throttle back" to maintain work-

ing speed while saving fuel. Your bigger, more costly power can be kept working more profitably on your earthmoving work.

Power-match your jobs with . . .

Cost-cutting drawbar power on rubber

Only International offers such a wide range of wheel tractor power sizes—allowing you to power-match your jobs and thus trim costs. In the heavy-duty class, for example, you can select from three power ratings: 61, 72.5, and 95 hp*, all with Multi-Range six-cylinder engines . . . gasoline, LP gas, or Diesel.

Multi-Range engine design and Torque Amplifier drive give an infinite range of work and travel speeds from less than one mph to 18 mph. You get bulldog lugging power for slow, heavy pulls. Throttle back and shift up for top fuel economy when the load is light.

An IH Dealer near your job will gladly demonstrate an International* 460, 560, or 660 or any others in the International line of eight sizes 13.4 to 95 hp*. For full-line catalog, write International Harvester Co., Dept. RS-1, P. O. Box 7333, Chicago 80, Ill.

*Maximum engine horsepower at standard conditions



INTERNATIONAL HARVESTER

. . . for more details circle 303 on enclosed return postal card



Self-loading in tough clay and shale, a 95 hp* International 660 heaps this 11-yd elevating scraper in 40 seconds. A combination like this slashes investment and operating costs on short-haul or clean-up work.

Compacting subgrade for a four-lane highway in Iowa, a 72.5 hp* International 560 handled this sheepfoot roller 80 per cent faster than the power formerly used, according to the contractor.



How Allis-Chalmers puts horsepower where it's needed—cuts contractors' costs



By keeping friction to a minimum in all moving parts of their compact HD-16, Allis-Chalmers engineers produced a machine that works right along side higher rated crawlers. The HD-16 heavy-duty model has 58 Timken® tapered roller bearings to practically eliminate friction in bevel gear and clutch shaft, final drive pinion, intermediate and sprocket shafts, track idlers, support rollers and truck wheels. The result is that

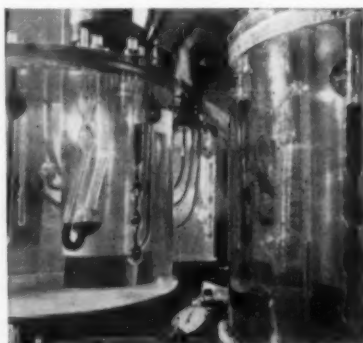
more of its 148 horsepower is delivered to the tracks—where it counts.

By making the most of the available horsepower, with Timken bearings to roll the loads, Allis-Chalmers gives contractors more *work power*—enables them to use a compact, less expensive machine for the job, increase their profits.



BEARING ENGINEERING ASSISTANCE, early in the design stage, helps manufacturers stretch bearing dollars. Timken bearing sales engineers have the training and are eager to help you with on-the spot engineering service.

... for more details circle 331 on enclosed return postal card



METALLURGICAL LAB develops the steels that will make tomorrow's Timken bearings last even longer, helps customers design more economically.



The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits. Canadian Division: Canadian Timken, St. Thomas, Ontario.

